ELECTRIC RAILWAY JOURNAL

FEB 25 1941

Volume 44, Number 16 McGraw Publishing Co., Inc. New York, Oct. 17, 1914

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East Pittsburgh
Pennsylvania

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Electric Railway Journal

New York, October 17, 1914

Volume XLIV No. 16

Contents

Pages 903 to 944

Making a Small Company Pay 906

How the Charlottesville & Albemarle Railway was brought from bankruptcy to prosperity by the introduction of modern generating and distributing equipment, one-man prepayment cars, park traffic, good headways and proper accounting methods.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914. 9 cols. Ill.

Mooted Principles in Valuation 913

Abstract of address delivered by Hon. Frank W. Stevens, chairman of Valuation Committees, New York Central Lines, before A. E. R. A. at Atlantic City—Discussion of distinctions between valuations of public utilities for different purposes.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914 6 cols.

Proceedings of Friday's Session of the Engineering Association Meeting 916

The concluding session of the American Electric Railway Engineering Association was mainly occupied with discussion of way matters. L. P. Crecelius was elected president of the association.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914. 6 cols.

Reports Presented at Concluding Session of the Engineering Association 918

The committee on way matters reported extensive data based on a comprehensive canvass of the association membership. The committee on heavy electric traction presented a brief report. Abstracts of the reports are given.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914.

The Improvement Club—An American Institution 921

W. T. Buchanan outlines the evolution and methods of local organizations formed for the purpose of bettering conditions, including street car service, in various sections of a city.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914. 4 cols.

Changes in Taxation Laws 923

Abstract of report of committee on taxation at A. E. R. A. Convention, showing modifications in state tax laws. Franchise tax burden on user—gross earnings tax truest measure of property value.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914. 4½ cols.

New Presidents of the Associations 926

Those elected were: Accountants' Association—C. S. Mitchell, Pittsburg Railway; Claims Association, William Tichenor, Terre Haute, Indianapolis & Eastern Traction Company; Engineering Association—L. P. Crecelius, Cleveland Railway; Manufacturers' Association—E. H. Baker, Galena Signal Oil Company; Transportation Traffic Association—M. C. Brush, Boston Elevated Railway.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914. 3½ cols. Ill.

Communications 929

Using the Technical Journal. Insert Special Work Failures.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914. 2 cols.

Equipment and Its Maintenance 930

Centers—Renewal and Repair—*By R. P. Williams.* Detroit United Portable Work Bench—*By C. L. Keller.* Device for Testing Controller Finger Springs—*By R. P. Parsons.* Proper Connections of Transformer Secondaries to a Self-Starting Rotary—*By J. G. Koppel.* Motor Truck for Line Maintenance. Inexpensive Shield for Welding Service. Car Cleaners' Refuse Pan. Emergency Kits at Junction Points. East St. Louis Pinion Pullers. Testing Dielectric Strength of Oil.

ELECTRIC RAILWAY JOURNAL, Oct. 17, 1914. 12 cols. Ill.

Editorials 903
Discussion on Reactance by A. I. E. E. 925
First Lecture in Correspondence Course 927
South American Trade Opportunities 928
Lessons from the South American Experience 928
News of Electric Railways 936
Financial and Corporate 938
Traffic and Transportation 940
Personal Mention 941
Construction News 942
Manufactures and Supplies 944

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Electric Railway Journal

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THE SUCCESS OF THE 1914 CONVENTION

In a time of general financial stringency, such as we are having at present, brought on by the catastrophe of the war in Europe, many fears were expressed as to the effect on the success of the convention. But they were not realized. It is true that the attendance was not quite so large as last year, especially as regards the roads at a distance, but most of the Eastern roads sent larger delegations than usual, and there was a marked earnestness on the part of the delegates in Atlantic City to obtain the most benefit from the trip. One general manager expressed the situation in our hearing as follows: "These are the times when the railroads must use every method and device which will produce a saving. Our gross receipts have fallen off 5 per cent, and it will be hard for us to maintain our usual 60-per cent operating ratio, but we are going to make every effort to do so. I felt able to send only one-half of the usual number of my men to the convention this year, but every man whom we have sent will make the most of his time, both among the exhibits and on the floor and will take back to those who did not come as much information to help them in their work as he can." The effect of this spirit, which seemed to be general, was evident throughout the convention in the earnestness with which the delegates participated in the discussions at the meetings and in the attendance at all of the sessions, which was noticeably larger than usual, and with the care with which they inspected the exhibits. The latter, as a whole, were equal, if not superior, in interest, to those shown in previous years, although they occupied about 5 per cent less space. In view of the attendant circumstances, the slightness of this falling-off is notable.

THE AMERICAN ASSOCIATION

The work during this past year of the American Electric Railway Association, as represented by the papers and reports at Atlantic City, was largely upon the subject to which our convention issue this year is devoted, that is to say, of public relations. The report itself on this subject was presented on Wednesday afternoon, and the sympathetic spirit with which it was received and the enthusiasm which its recommendation inspired showed that the necessity for prompt and vigorous action along these lines was generally realized. We have already discussed in our daily issue for Thursday the recommendations made by this committee as well as its proposed code of principles, and its suggestions should be carried out soon. Other notable papers and reports at the American convention were the address on valuation by Mr. Stevens, presented at the meeting on Tuesday, and the excellent reports on carrying United States mail, federal relations, cost of passenger transportation service, taxation and the most instructive paper by Mr. Stearns. This latter paper will be published in our issue of next week. Everyone who reads even cursorily the papers and reports presented at the meeting of the American Association will be impressed with the serious character of the problems with which the industry is face to face—problems which concern not only the industry but the public as well, because the interests of each community are necessarily closely associated with those of the utility which provides its transportation service. It cannot prosper if that is crippled and is unable to meet legitimate demands for transportation. With the larger fund which the association will have through the increase in dues decided upon at Atlantic City, its possibilities for doing more effective work are increased, and we look forward to an even more successful association record as a result of the coming year's work.

THREE CARDINAL INVESTMENT PRINCIPLES

In his address Wednesday on the company's point of view regarding electric railway securities, Calvert Townley brought out three principles which are at the foundation of the electric railway financial problem of to-day. They are as follows: (1) Railways must grow with the communities they serve, and the resulting additions and betterments required cannot possibly be financed out of the earnings; (2) security selling is competitive, and if electric railway securities are to be sold they must be comparatively attractive, in price and yield, and (3), financial and commercial conditions are constantly changing so that fixed rates of return cannot be expected to attract for a long term of years. The importance of these principles needs no demonstration among electric railway officials, but the problem is how to impress them properly upon the public mind. When citizens, legislators, congressmen and public service commissioners realize these facts, they will know that the imposition of one-sided bargains on electric railways will cause only a reduction of profits, a dearth of capital for needed extensions and a throttling of community growth. Naturally, electric railway securities should be among the most popular offered, and this has been largely the case in the past, but it cannot continue if capital is to be legislated into ever less remunerative or permanently blocked channels.

It is impossible to have too much publicity on these points. As one writer in our convention issue said, the company figuratively must live in a glass house for the exhibition to the public of its daily activities. Such a broad policy of publicity, bringing to public view the company's side of daily operating problems, is certainly most desirable. Yet the term, as Mr. Townley used it, and as we used it above, refers also to that more intangible but eminently desirable process of education whereby the public mind is gradually attuned to a proper appreciation of fundamental railway economics. In connection with such basic principles of electric railway investments as outlined above, educative efforts cannot be made too carefully or too seriously.

THE UNIVERSITIES AND THE INDUSTRY

An interesting feature of the convention this year was the large number of educators present. This is as it should be. The date at which the convention is held—at the beginning of the college year—makes it very difficult for the active college teacher to be present. Nevertheless, the effort on the part of the association to bring about a closer relation between institutions of learning and the industry was successfully inaugurated this year, and as the advantages of such a connection to both become better understood, we believe there will be a growing co-operation between the two, a co-operation which will not be confined to attendance by the teachers at the annual convention.

The universities and the industry have much to gain from such closer relations. The industry needs the ability for analytical study and research for which years of training have fitted the universities and it needs a sympathetic interest and thorough understanding of its problems on the part of the men who direct the departments of research and mold the minds of our future citizens. The industry also needs the influx into its ranks of the educated men whom the universities are graduating. But the benefits will not be on one side only. Those which the universities can secure from a close touch with the industry are no less great. They comprise opportunities of study and improvement in the laboratory of human industry and reality rather than in the miniature laboratory within the college walls.

The departments in the university with which the closer relations of which we are speaking should be developed are not those purely of engineering. There are many engineering problems to be solved in the electric railway business, but there are other departments of university work with which electric railway companies are rapidly coming into as close, if not closer, touch than with those of engineering. We hope that at the next convention an invitation from the association will be extended not only to the professors in engineering courses as was done this year, but also to those concerned with the science of government and economics. The electric railway problems in this field which must be solved if this country is to progress are acute and of the greatest magnitude, and if the interest of the universities can be enlisted to study these questions thoroughly at first hand a great benefit should be achieved. We hope that the general campaign decided upon at Atlantic City to inculcate right thinking into the body politic will be sufficiently broad to cover this point.

FEATURES OF THE T. & T. CONVENTION

That the Transportation & Traffic Association has behind it a remarkable record of accomplishment is shown in the reports of the various committees. The association has now succeeded in developing, in pracically complete form, standard codes of rules for city and interurban service, the former code having reached its final stage last year, as the only revision submitted at the convention was an amendment to the long-discussed Rule 55. The interurban code, during the past year, has been made consistent in diction throughout as well as made to harmonize with the city code and with that of the American Railway Association in so far as this is possible. This achievement is something of which the association may well be proud, for the difficulties in the way of bringing together the conflicting opinions and varying conditions of hundreds of different railways might easily appear to be an impossible task. Indeed, it was so looked upon by many when the work of preparing the standard codes was undertaken several years ago.

The work of the committee on express and freight traffic has also been exceptionally valuable to the association, not only in pointing out the possibilities of this comparatively new means for increased revenue for electric railways but also by providing, in detail, information as to the means whereby such a business might best be undertaken.

It would seem that the nature of the work of many of the Transportation & Traffic Association's committees is tending more and more toward the custom of having each committee originate, to a large extent, the subjects which are to be considered and discussed before the association in convention. This has applied especially to the work of the committee on transportation employees owing to the fact that the scope of its efforts has been largely extended owing to the safety first movement. It applies also to the committee on fares and transfers and on passenger traffic, both of which have placed before the association discussions on new methods of fare collection and of passenger transportation.

This year the Transportation & Traffic Association has extended its activities to a large extent by a greater development of the joint-committee idea, considering matters in conjunction with the other associations through committees on block signals, on transportation engineering, on block-signal rules and on transportation accounting. The association has even gone one step further this year by holding a session with both the engineering and claims associations to consider the general subject of accident prevention, and it cannot be denied that this marked extension of co-operative action between the various organizations affiliated with the American Electric Railway Association will add materially to the breadth of the information secured.

WHAT THE ACCOUNTANTS ACCOMPLISHED

The sessions of the Accountants' Association at Atlantic City during last week were marked not only by good attendance and the presence of new members but also by the really constructive work accomplished. The committee reports submitted this year were as a whole most valuable contributions to electric railway accounting theory and practice. With the formal adoption of the new Interstate Commerce Commission uniform system of accounts by the association, the classification committee saw the attainment of its longed-for goal. Work still remains to be done, both in rectifying slight errors or omissions that only time can disclose and in striving, with the assistance of the committee representing the association at the National Association of Railway Commissioners convention, to bring about the adoption of the uniform system by all state commissions, but we are confident that the classification committee will continue to display the same combination of assiduous effort, sound judgment, earnest co-operation with regulatory commissions and steadfast devotion to association interests that has characterized it in the past.

The newer committees on freight and express accounting, accounting definitions and education all produced desirable results. While the endeavors of the committee on education have probably had the most tangible outcome, the other two committees laid firm bases for advancement toward the standardization of freight and express accounting and accounting definitions. The securing of uniform accounting definitions was and will be particularly difficult in view of the divergent attitudes of accounting authorities and especially the controlling public service commissions on various accounting practices, but the collating of all commission rulings on both disputed and undisputed points will be valuable as showing the weight of opinion and the amount of work yet to be done to secure absolute uniformity. The most obvious way, of course, to bring about such uniformity is to secure if possible the universal adoption of the Interstate Commerce Commission classification. State commissions now have an opportunity to sacrifice minor differences for the good of accounting practice.

Not by any means in the background, on account of its scope and content, was the report of the committee on engineering-accounting, covering overhead charges, inter-departmental charges and cost accounting. It is the attention given to such subjects that marks the perfection of accounting procedure and scientific management to-day, and the report of the committee is fully deserving of the more extended study that we shall give it later. The recommitment of the report on claims-accounting was largely brought about by minor differences of opinion among the claim agents as to the relative importance of certain accounts, as well as by an alleged lack of mutual exclusiveness among the accounts, but these points can readily be cleared up this year by the proper circularization of the two associations concerned.

Space permits us to comment only briefly on the excellent addresses delivered by Messrs. Wildman, Swift, Fogarty and Sealy, all of whom presented timely, instructive and authoritative discussions on important issues in the electric railway field. It would be improper to leave this résumé, however, without referring to that improvement of association organization contributed by the outgoing officials, through the standardization of committee organization and membership. The definite choice of nine standing committees, with the provision that the majority of their members shall continue over from year to year in order to insure continuity of committee efforts, will be an almost indescribable aid to the new officers. The establishment of a three joint standing-committees will result in greater co-operation and sympathy between the four associations, while the institution of the new standing committee on passenger accounting, with the retention of the committee on freight and express accounting, takes care of a subject of vital importance in all questions relating to an increase of rates, namely, the segregation of expenses between freight, passenger and express business.

POWER MATTERS AT THE CONVENTION

Two eminently serviceable reports on the subjects of power generation and power distribution respectively were presented at Atlantic City. The power end of electric railways is liable to be overshadowed by the more conspicuous and less technical, although no less difficult, transportation, accounting and other parts of the business. The railways must have power to propel their cars, and it is fitting that power problems particularly affecting railways should be carefully considered by the Engineering Association.

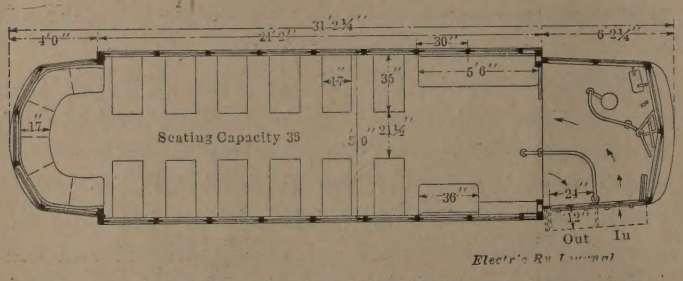
The report on distribution was taken up largely with specifications and revisions thereof. This kind of work is extremely tedious, both in collecting the original data and in phrasing the specifications to insure the getting of the best possible materials without imposing unnecessary hardships upon the manufacturers and thus inflating the cost of the product. There is no way in which an association can exert an influence and achieve prestige more surely than through the maintenance of satisfactory standard specifications. The association's thorough method of handling specification preparation insures good work. Every word in this particular report has been carefully weighed. The retiring chairman of the committee deserves more than verbal thanks for the work which he has done or inspired.

The other report was made up of monographs, and this fact was briefly commented upon in our issue of Oct. 3. We also recently called attention to the diminishing number of convention papers not including in this statement, of course, those individual or joint contributions to committee reports. Now it requires no argument to prove that, for the benefit of its members, the association wants all real contributions to knowledge in its field, but space cannot be found on the programs for them in the form of papers. They can, however, be presented efficiently through committee reports, thus insuring proper correlation of subjects and unity and coherence in their presentation.

Making a Small Company Pay

How the Charlottesville & Albemarle Railway Was Brought from Bankruptcy to Prosperity by the Introduction of Modern Generating and Distributing Equipment, One-Man Prepayment Cars, Park Traffic, Good Headways and Proper Accounting Methods

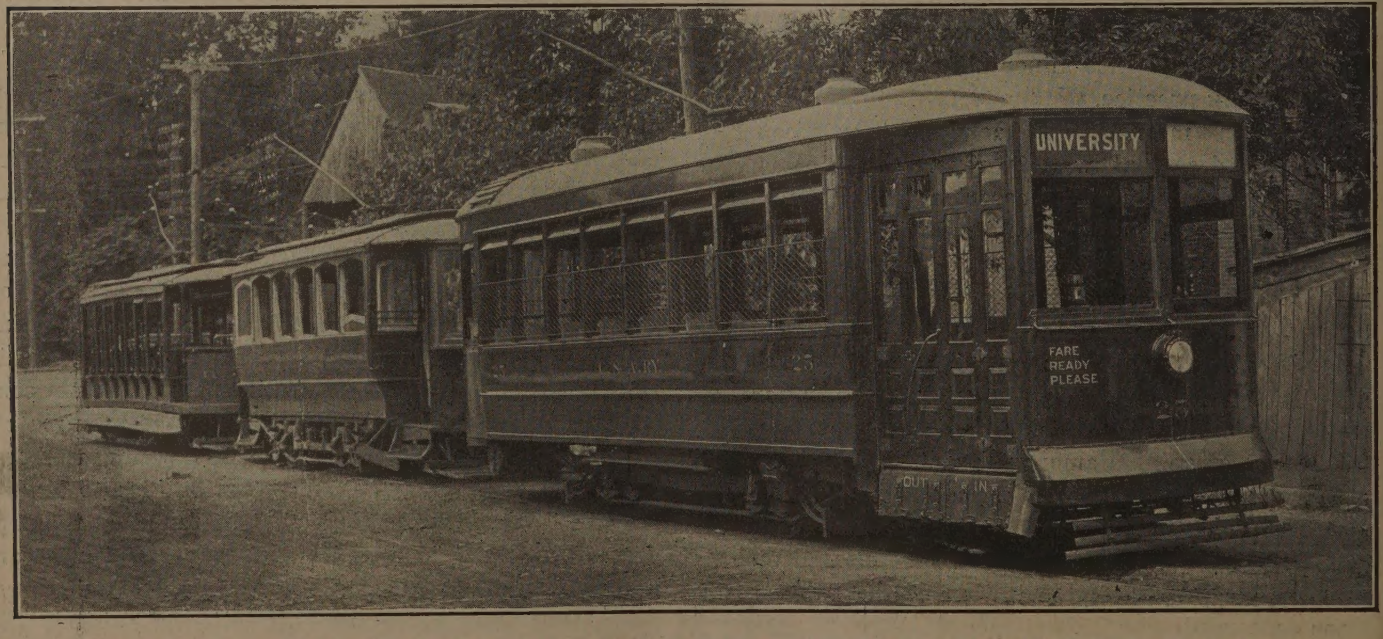
Charlottesville, Va., is a town of about 12,000 people, situated in the foothills of the Blue Ridge Mountains about 97 miles northwest of Richmond and 114 miles southwest of Washington. It is the county seat of Albemarle County, one of the rich agricultural counties of Virginia noted especially for its apple orchards and for the celebrated Albemarle pippin, of which the greater part of the crop is exported to Europe. The fine climate and beautiful foothill and mountain scenery have attracted many wealthy people from the North and West, who have added largely to the handsome residences in the country surrounding Charlottesville, which district, it is predicted, will some day become the Touraine of America. The city promises to figure in the future as a radiating point for interurban railways extending to prosperous sections of Albemarle and adjoining counties. Steam railroad service is afforded by the Chesapeake & Ohio and the Southern Railways, which here intersect and make the city a railroad center of some importance. Charlottesville has a few silk, woolen, lumber and agricultural manufactories, but it is better known as the home of the University of Virginia, to which some 960 students reported during the college year of 1913-1914. This state university was planned and its older buildings designed by Thomas Jefferson, including the Rotunda, here illustrated, which is a reproduction on a reduced scale of the Pantheon at Rome and which towers the large college library. The university buildings in general recall "Monticello," the home which the great statesman-architect built on one of the near-by mountains.



C. & A. RAILWAY—PLAN OF ONE-MAN NEAR-SIDE CAR

Sources of Business

In a town of the size and few industries of Charlottesville there would seem to be little chance for the development of a profitable electric lighting, power and railway utility. Further, the lighting department of the Charlottesville & Albemarle Railway has to meet municipal gas competition, while the railway runs over but one route, Main Street, from the Chesapeake & Ohio Railway station, at one end, past the Union station to the university and railway park gounds at the other end. As the original length of route was but 3 miles it is evident that profitable business in this field was out of the question if people were to ride only because they had to do so. In any event, the deficits grew larger and larger from the time that the company was formed in 1903 to its purchase by the present owners in July, 1912. At that time the rehabilitation of the property was entrusted to John L. Livers, now vice-president and general manager. Under his direction the company built an entirely new power plant, changing over from d.c. to a.c. distribution, installed modern prepayment cars with one-man near-side operation to give a frequent and attractive service on an economical basis, converted a money-losing hotel into a set of six cottages and park furnishings, and developed the lighting and power business along popular and more business-like lines. The fruits of the new order began to appear in June, 1914, when the company was earning about twice its fixed charges and when it declared a semi-annual dividend of 3½ per cent on its preferred stock. This was the first dividend in its history. Furthermore, the business, while increasing rapidly, is still well within the saturation possibilities of Charlottesville, so that the owners feel that the outlay of new capital was well worth while. However, it will be clear from the fol-



C. & A. RAILWAY—THE NEW NEAR-SIDE AND THE OLD CLOSED AND OPEN CARS IN LINE

C. & A. RAILWAY—ONE-MAN NEAR-SIDE CAR IN FRONT OF THE ROTUNDA, UNIVERSITY OF VIRGINIA

lowing detailed account of the changes made in each department that the financial success of the company has been due to something more than the influx of new money. In the earlier days, especially, the exercise of mother wit, ingenuity and civic spirit accomplished more than cash alone.

TRACK AND CARS

When the property was taken over in July, 1912, the entire trackage, including sidings, was but 3 miles. As the new management had decided to use one-man single-end cars, changes in the track were necessary at each end of the line. The company was anxious to build a loop at its downtown terminal at the Chesapeake & Ohio station, but it has never been able to get permission from the railway which owns the ground necessary for the loop. The electric railway met the situation by building a cheap turntable by means of which the motorman-conductor readily turns the light cars in use. An extension of ½ mile has been built and a branch extended 1100 ft. directly to the new stadium of the university. The number of sidings on Main Street has also been increased from three to five to enable the railway to give the remarkably short headway of five minutes in a town of 12,000 people. An excellent class of houses is now being erected in the vicinity of the university, the growth in this section being greatly encouraged by the assurance of frequent service to the downtown shopping section.

Two interesting incidents arose in 1912 during the period of track reconstruction and extension. Part of the track at the uptown end was on a badly decayed trestle. This trestle was 200 ft. long and would have cost about $850 to replace. Mr. Livers, however, foresaw that the growth of Charlottesville in this direction would make it far more desirable to fill this section up to grade and to macadamize the roadway alongside. A suggestion to this effect was made to the county commissioner, accompanied by the company's offer to share the expense. Residents along the line were also solicited to favor the improvement and bear a part of the cost. As the result of this missionary work, the road

C. & A. RAILWAY—CHILDREN'S DAY AT FRY'S SPRING, WITH SLIDE IN THE BACKGROUND

was macadamized at a cost to the railway of only $100, thus saving $750 compared with rebuilding the trestle, beside securing a safer and permanent construction.

The other incident was the solution of a clearance difficulty. In making the extension at the university end of the line it was found that the old monitor-roof cars would be unable to clear a viaduct of the Chesapeake & Ohio Railway. The electric railway could not afford to raise the viaduct, even if that had been practicable, but avoided the opposite dilemma of lowering the grade of the roadway by the happy expedient of converting from monitor to arch-roof type its original nine open and five closed cars. This change was made by a local carpenter at the rate of $6.75 per car for labor and material, the latter item including sheet-iron ventilators similar in form to those seen on a chimney.

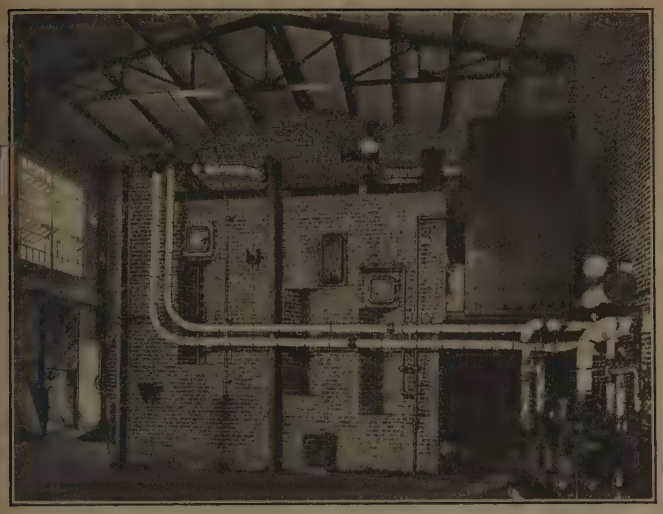
Previous to its purchase of new one-man cars, the company worked wonders with some of the old closed cars by painting the interiors with ordinary bathroom enamel, while the exteriors were painted orange and blue, the colors of the University of Virginia, thus making them more attractive to the students. The cars were also equipped with tungsten lamps. These changes were very inexpensive, but they gave to the cars an air of cleanliness and cheer which met with a hearty approval from the public. However, the cars were of such old-fashioned and heavy build that it would have paid to take them out of regular service almost on the basis of the saving in energy alone. This point is indicated by the fact that the old cars weighed between 24,000 lb. and 30,000 lb., whereas the 31-ft. 2¼-in., one-man near-side car, which averages, say, 5 ft. 2¼ in. more in length, weighs but 18,000 lb. As a single-platform car, with five rows of cross-seats per side and the usual end circular seat and longitudinal seats, the near-side design seats thirty-six passengers compared with an average seating of twenty-four in the longitudinal seat cars. It is true that the usual ride in Charlottesville is short, but for that very reason it was felt that the seating must be attractive and ample to get the business. The safety features of the near-side car constitute another great improvement over the old cars, while the savings of one-man operation are a potent factor in making possible more cars and, consequently, a frequent headway.

The first order placed with The J. G. Brill Company for near-side cars comprised five. One of these cars was exhibited by the Near-Side Car Company at the October, 1913, convention of the American Electric Railway Association, where its vivid orange, in honor of the University of Virginia attracted many visitors to examine its more substantial qualities. This car proved so popular that the company placed two more in service in June, 1914, making seven in all. All of the cars are of the single-truck type, 31 ft. 2¼ in. over all and 21 ft. 2 in. between the corner posts. An accompanying plan shows the arrangement of seating and of the railings on the 6-ft. 2¼-in. front platform. Owing to a moderate ramp the step heights from the rails to the car floor are but 13 in., 13 in. and 8⅝ in. The only doors used are on one side of the platform, and these are operated by the motorman-conductor in connection with the step. The car body weighs 9500 lb. without equipment. The underframe is made up of steel plates and structural shapes and the body of wood. The interior is in cherry with oxidized trimmings. The trucks are of the Brill 21-E type, with 8-ft. wheelbase. That the operating equipment and minor-furnishings are modern in every particular appears from the use of two GE-200 motors with No. 36-J controller, General Electric air brakes, Consolidated heaters with thermostat control, Consolidated buzzers for the passengers' push-button system, Rico sanitary strap sleeving and tungsten lighting. Air brakes for a single-truck car are uncommon, but they are naturally of great convenience in one-man operation. Tickets are sold six for 25 cents, and these as well as straight 5-cent fares are deposited in New Haven fare boxes.

C. & A. RAILWAY—DANCE HALL WITH SELF-PLAYING ORCHESTRAL ORGAN. NOTE ALSO SASH, RADIATORS AND OTHER FIXTURES FROM A DISMANTLED HOTEL

While the merits of the new cars were quickly appreciated by the public, the railway management made it a point to announce to its patrons that "these cars were built for you." The attitude of a local paper was summarized in its editorial statement concerning the two latest cars, namely, that "They mean one step farther for a larger and better Charlottesville."

All of the cars are equipped with an original station and trip indicator invented by Curtis L. Carter, superintendent of the company. It was devised because some difficulty had been found in keeping the cars on Main Street to such close time that they would pass each



C. & A. RAILWAY—BOILER ROOM SHOWING VERTICAL SLIDING DOOR IN COAL STORAGE AT LEFT

other at any of the five sidings without delay to either car.

Essentially the device consists of an ordinary clock movement, about the size of an alarm clock, arranged for suspension from a hook on the vestibule framing in front of the motorman. The dial consists of a time-table upon which the switches and streets are marked. This dial revolves with the regular clockwise motion so that each switch or station in turn is brought under a pointer fixed on the left side of the clock. The object of the pointer is to designate the point at which the car should be at any given time. Consequently, if the car is at, say, East Fourth Street when the pointer indicates East Fifth Street, the motorman knows that he is one block behind, or if he is at East Sixth Street he knows that he is one block ahead. In this way he can keep on schedule at all times without consulting his watch or a time-table. Arrangements are now being made to place this combination clock and time-table on the market.

The company has, of course, scrapped most of the old closed cars, but one of them has been converted to a work car. No funds were available for an elaborate carhouse, nor was one needed in this climate. Nevertheless, a satisfactory shelter was erected by using old rails for the framing and clothing it with corrugated iron. A reduction from $2.40 to $1.01 per $100 in the insurance rate was also allowed by the underwriters because of a few changes and improvements such as bonding rails, removing wooden floors, installing a line cut-out switch, filling in bad spots, etc. All electrical work is done at home in connection with the lighting and power department.

C. & A. RAILWAY—POWER STATION AND CONCRETE TRESTLE AS SEEN FROM THE REAR OF THE STATION

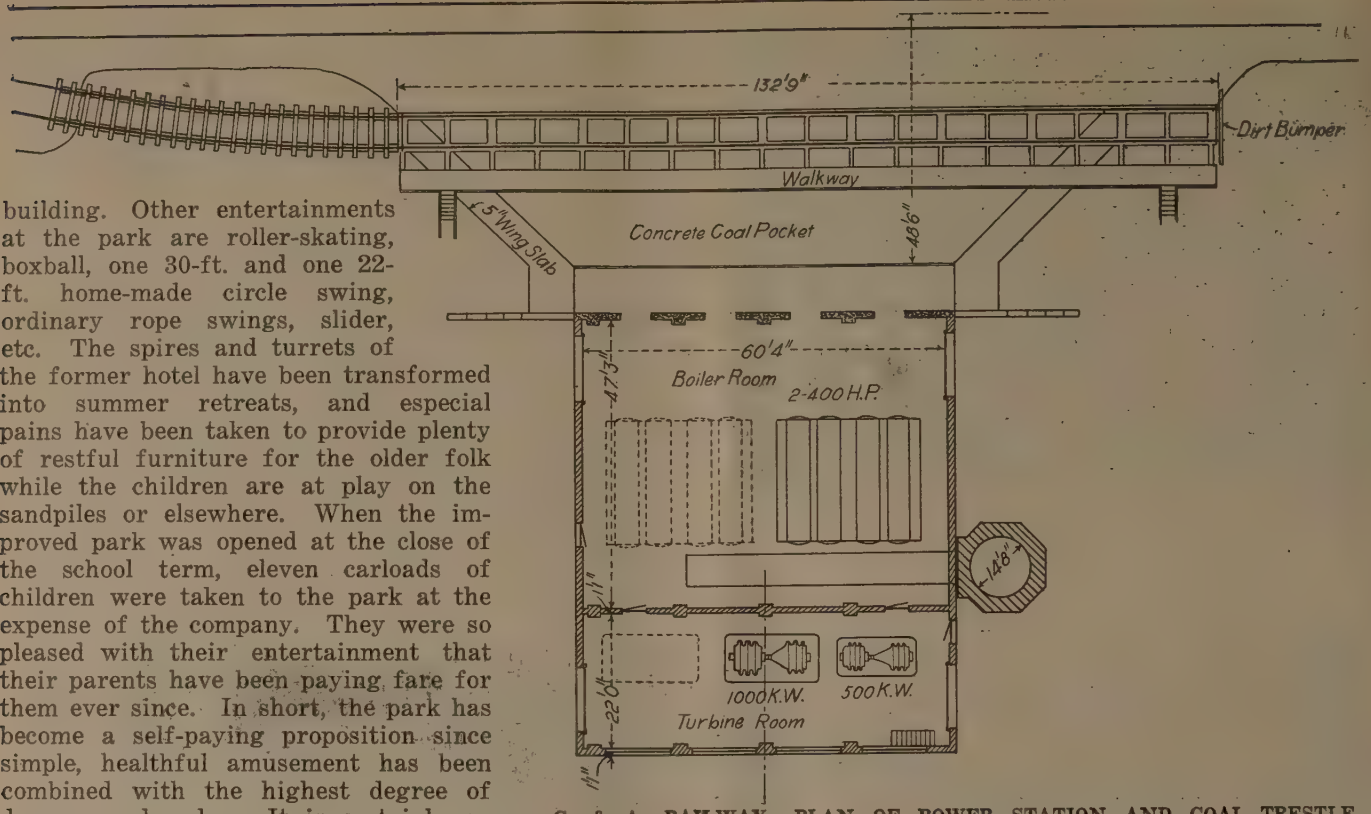
Profitable Park Business

Near the university end of Charlottesville the company owns Jefferson Park, a 13-acre natural playground. This park, of course, depends for patronage only upon the white population of Charlottesville, which does not exceed 8000. Originally the park had little more than a dancing pavilion, its trees and bushes and Fry's spring, a local health source of some note. The water contains sulphur and iron, but it is not suitable for bottling because it discolors rapidly.

In planning to make the park more attractive the company was fortunate in being able to dismantle a large hotel near by. This hotel had proved a financial failure, but as it was comparatively new its salvage value was high. After six cottages had been built from its materials, plenty of timber, glass and other items were left to furnish the park. In the first place the dancing pavilion was glazed completely with windows, which can be raised to make the pavilion as airy as desired or lowered to make it comfortable on chilly nights. A number of the hotel radiators are available for really cold weather, and the toilets, chairs and kitchen equipment are also from the hotel. The pavilion is attractively decorated with national flags and college banners or streamers, in addition to which handsomely framed photographs supplied by the General Electric Company remind visitors of the many domestic applications of electricity.

C. & A. RAILWAY—INTERIOR OF TURBINE ROOM WITH SWING SASH ON THE RIVER SIDE

One of the most important changes in the operation of the dancing pavilion was the substitution of a Welte electrically-played organ for human musicians. Under the old method the cost of the musicians actually exceeded the entire park receipts. Contrariwise, the organ has paid for itself in little more than a season, it has proved entirely satisfactory for dance music, it is ready with a large repertoire at any time, and it never tries to dictate to the taste of the public. In addition to dancing at the pavilion, moving pictures are flashed upon a screen from an operator's booth outside the

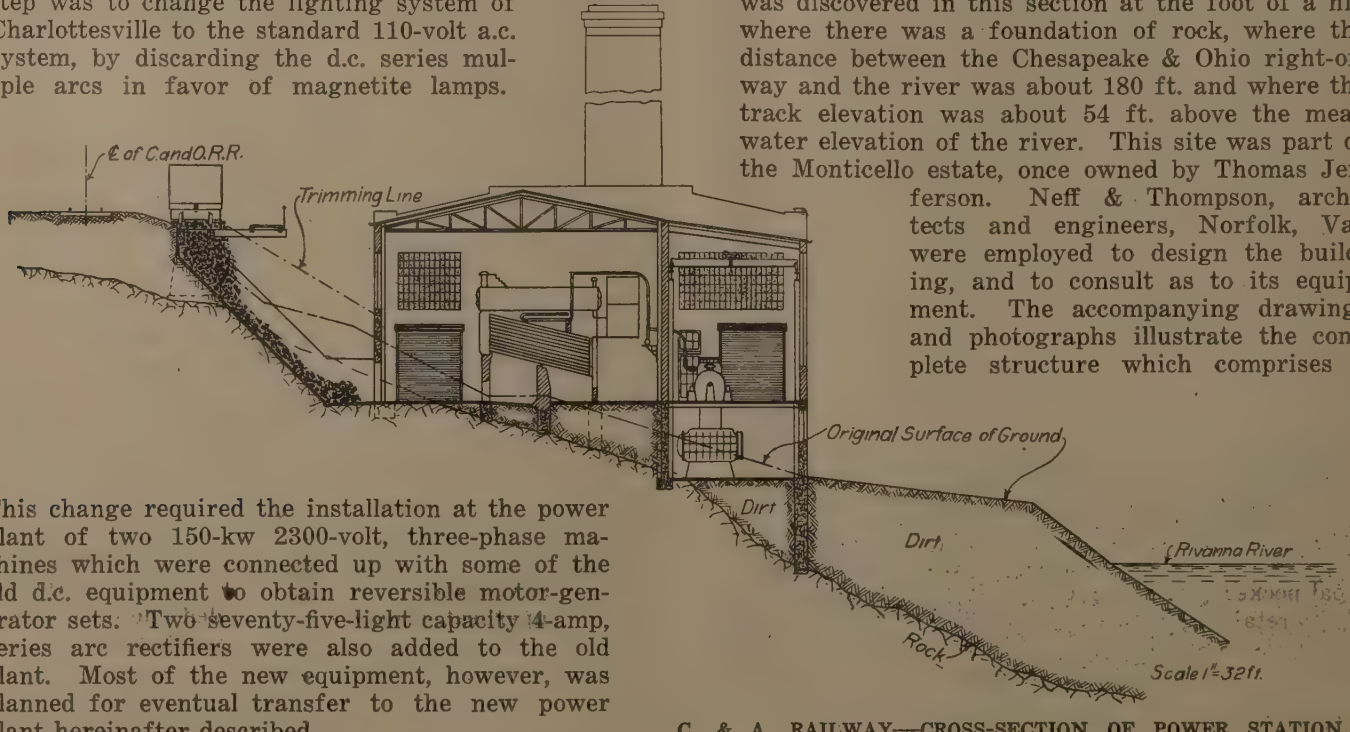


C. & A. RAILWAY—PLAN OF POWER STATION AND COAL TRESTLE

building. Other entertainments at the park are roller-skating, boxball, one 30-ft. and one 22-ft. home-made circle swing, ordinary rope swings, slider, etc. The spires and turrets of the former hotel have been transformed into summer retreats, and especial pains have been taken to provide plenty of restful furniture for the older folk while the children are at play on the sandpiles or elsewhere. When the improved park was opened at the close of the school term, eleven carloads of children were taken to the park at the expense of the company. They were so pleased with their entertainment that their parents have been paying fare for them ever since. In short, the park has become a self-paying proposition since simple, healthful amusement has been combined with the highest degree of decency and order. It is certainly an unusual achievement in a town where everyone is within easy reach of open country and woodland.

Power Rehabilitation

The original d.c. power plant of the Charlottesville & Albemarle Railway was in the heart of the city in a location where a cheap water supply could not be obtained. The units consisted of one 100-kw and three 150-kw generators belted to one 300-hp and one 500-hp Corliss engine. With the growth of Charlottesville the 440-volt three-wire d.c. system of distribution had become uneconomical while the machinery itself was practically obsolete. In fact, the cost of generating power was sometimes as high as 8 cents per kw-hr. The first step was to change the lighting system of Charlottesville to the standard 110-volt a.c. system, by discarding the d.c. series multiple arcs in favor of magnetite lamps.



C. & A. RAILWAY—CROSS-SECTION OF POWER STATION, COAL DUMP AND GENERAL LAYOUT

This change required the installation at the power plant of two 150-kw 2300-volt, three-phase machines which were connected up with some of the old d.c. equipment to obtain reversible motor-generator sets. Two seventy-five-light capacity 4-amp, series arc rectifiers were also added to the old plant. Most of the new equipment, however, was planned for eventual transfer to the new power plant hereinafter described.

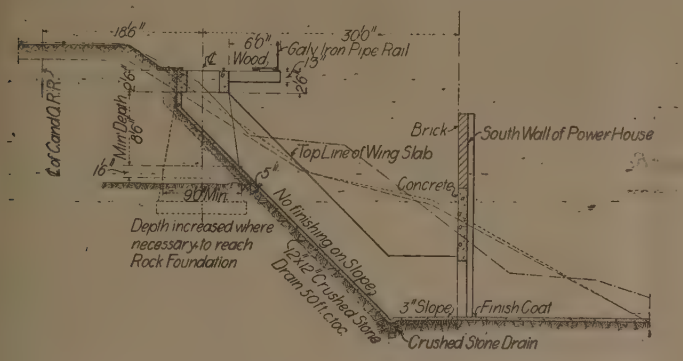
In February, 1913, the company was obliged to order a 500-kw Curtis turbine, owing to a flywheel explosion on the 500-hp Corliss engine. As no condensing equipment was on hand, the company made a surface condenser out of an old boiler. This accident was only one of many power difficulties before the new plant was ready.

Power Station

Before the site for the new plant was selected, a careful study was made of all the surrounding country, and a location was discovered which was admirably suited for the needs of the company. About 2 miles east from the city the tracks of the Chesapeake & Ohio Railway nearly parallel the banks of the Rivanna River. A point was discovered in this section at the foot of a hill where there was a foundation of rock, where the distance between the Chesapeake & Ohio right-of-way and the river was about 180 ft. and where the track elevation was about 54 ft. above the mean water elevation of the river. This site was part of the Monticello estate, once owned by Thomas Jefferson. Neff & Thompson, architects and engineers, Norfolk, Va., were employed to design the building, and to consult as to its equipment. The accompanying drawings and photographs illustrate the complete structure which comprises a

turbine room 60 ft. 4 in. x 22 ft. and a boiler room 60 ft. 4 in. x 47 ft.

The entire arrangement is a model of convenience and simplicity. A siding was installed upon a specially designed concrete trestle, the sloping railway embankment was covered with a concrete slab, and at the foot of the embankment the boiler-room floor was located so that



C. & A. RAILWAY—DETAIL OF CONCRETE COAL STORAGE

coal dumped from the hopper-bottomed cars would by gravity slide down this 1000-ton coal pocket at an angle of 45 deg. into the boiler room directly in front of the hand-fired boilers. The rate of flow into the boiler room is controlled by manually-operated vertical sliding coal doors in the wall between the coal pocket and boiler room. The turbine-room floor was located at the same level as the boiler-room floor, and ehe turbine-room basement in which the surface condensers were installed was obtained with the minimum amount of excavation, the condenser piping being connected directly with the river. All of the foundations of the building were of reinforced and plain concrete, reinforced where subjected to water pressure from the outside during such times as the river is in flood and also in the

C. & A. RAILWAY—SCHEDULE CLOCK

coal pocket where the south wall of the boiler room acts as a retaining wall for the coal pocket. In other locations plain concrete was used. On these concrete foundations the exterior walls and division walls of hard burned common red brick were constructed, the brickwork being laid up with mortar containing a liberal amount of Portland cement. These walls are bearing walls, that is to say, they contain no built-in columns of any kind. All of the sash are of the Lupton roll-steel type arranged with a liberal number of pivoted sections for ventilation, the various pivoted sections being operated by means of gang operating devices so that all openings on one side of the building are controlled simultaneously from one position. This sash is wire-glazed except that the lowest row is of French clear plate to give the turbine-room attendant a good view of the river conditions. The larger door openings are protected by means of interlocking-slat rolling steel doors, the smaller openings are fitted with metal covered doors and frames. The roof construction consists of structural steel trusses with channel-iron purlins and thin "Ferroinclave" reinforced concrete slab formed by the use of dovetail sheet metal with a 1½-in. layer of concrete on the top and a ⅜-in. coating of plaster on the underside. On top of this concrete slab was placed about 5000 sq. ft. of the H. W. Johns-Manville Company's J-M asbestos three-ply built-up roofing. The brick stack, which is located at the front end of the building, is of the Custodis type, 175 ft. high and with an inside diameter of 7 ft. 6 in. at the top.

The inside facing of the turbine-room walls is an impervious pressed brick of buff color. There is also a wainscoting of cherry-red quarry tile with a tile floor, and this finish with the neat tungsten fixtures gives the interior a most agreeable appearance. The concrete floor is reinforced with Kahn bars. Any parts of the machinery can be moved with a hand-power 10-ton Reading crane. The turbine room also contains a high-grade toilet, washroom and shower bath equipment.

The underwriters have given this completed building a rate of 8 cents per $100 of insurance carried. This represents probably the lowest rate which has ever been given a power house in the South, and as a matter of fact is within 1 cent of being the lowest possible rate obtainable upon a power house in the Southern cities under the existing insurance schedule. This result was made possible by the architects and engineers, who, before the building was started, had a thorough and definite understanding with the underwriters concerning their requirements, penalties, etc. The only place in which they departed from the requirements of the underwriters was in connection with structural steel which the insurance companies wanted to have protected throughout with fireproofing. It was found upon investigation, however, that to protect the structural steel members supporting the roof slab in this way would cost more than was justified by the 1 cent in insurance rate which could have been saved in this manner. The company in its old plant paid 24.1 cents per $100 instead of the 8 cents per $100 which it now pays.

While the exact cost of this completed station is not available, the owners assert that the slight increase in the cost of a fireproof building of this character over a building of ordinary construction was amply justified by the saving in insurance alone, although if the saving in insurance was entirely neglected the saving in the cost of repairs would justify this expenditure. Of course, it is also worth much from an operating standpoint to have a power house that will be subjected to a minimum degree to interruptions from fire.

POWER-HOUSE EQUIPMENT

The boiler room contains two 400-hp B. & W. boilers which are operated at a pressure of 175 lb. and 100 deg. Fahr. superheat. Room is provided, however, for a duplicate equipment. The superheated-steam lines are extra heavy pipe with Shawco bell-turned joints and high hub steel flanges, cast-steel fittings and cast-steel body valves. A separate saturated steam connection from each boiler supplies steam to a header for steam to

the boiler feed and air pumps, and other auxiliaries. The piping was designed and installed by the Benjamin F. Shaw Company, Wilmington, Del. It comprises a total length of about 700 ft., all covered with 85 per cent J-M magnesia covering.

The condensers for the turbines are of the surface type, manufactured by the Wheeler Condenser & Engineering Company. They maintain a vacuum of approximately 28½ in. to 29 in. of mercury. The condensate is used for boiler feed, supplemented by water from a spring on the property, while circulating water is taken from the river and returned at a point below the plant. One GE water-flow meter and two steam meters are installed to keep an accurate check on the steam-raising equipment. The boiler feed pumps are of Epping-Carpenter make, and the feed-water heaters are of the Stilwell-Bierce open type.

The turbine room now contains the 500-kw 3600-r.p.m. unit which was taken from the old plant. This machine is connected to a 2300-volt, three-phase, sixty-cycle generator. The second Curtis turbo-generator set is of 1000-kw capacity. It is also operated at 3600 r.p.m. and supplies the same kind of current. Foundations have already been provided for a duplicate 1000-kw set. The exciters consist of one 25-kw, 125-volt, d.c. generator, direct-connected to a 3600-r.p.m. non-condensing Curtis turbine. There is also one 17½-kw, 1800-r.p.m. motor-generator set with 125-volt generator, compound-wound and 2200-volt, three-phase, sixty-cycle motor.

The switchboard is of standard General Electric design, the material being of natural black slate panels 1½ in. thick in three sections, 90 in. high, mounted upon pipe framework. The instruments have dull black finish. The panels reading from left to right are as follows:

1—Swinging bracket containing power factor and synchronizing instrument.
1—17½-kw exciter panel
1—25-kw exciter panel
1—500-kw generator panel
1—1000-kw generator panel
2—a.c. feeder panels, capacity each 1250 kva.
1—Tirrill regulator

The current as generated at 2300 volts is carried into Charlottesville over two circuits. The only other wires from the power plant are for a private Bell telephone system which ties in the power station, substation, office and carhouse.

The day load at the present time averages approximately 300 kw and is rapidly increasing. The night load line, which averages about 600 to 700 kw for a short period, is also building up quite rapidly. The efficiency of the new plant as compared with the old one is indicated by the fact that for 175,000 kw-hr. a month it is actually using only four cars of coal compared with fourteen to fifteen cars when a load of only 125,000 kw-hr. a month was carried.

The old plant is still being used for the mercury arc rectifiers and a.c.-d.c. sets, but it is planned to transfer this equipment to a new brick substation and office building on Main Street near the car shelter, so that both cars and machinery may be cared for by only one man.

PROMOTION OF LIGHT, POWER AND RAILWAY BUSINESS

When the property was taken over by the present management, the office of the company was located at the power plant instead of being on the business street of the town. No solicitors were employed, rates were high and inconsistent, and it is reported that considerable money had been lost through improper accounting and unpaid service. One of the first steps was to rent a store located on Main Street, where the public could conveniently do business with the company and see frequently its display of electrical specialties and wiring supplies. The old rates of 18 cents per kw-hr. maximum to 5 cents minimum were reduced to 12 and 4 cents respectively, with a second minimum of 3 cents per kw-hr. for large-motor service. Solicitors who were sent out met with such success that the number of customers was increased from 300 in 1912 to 1006 in June, 1914.

The retail sales of electrical supplies also rose rapidly, as is indicated by the fact that for the year ending June 30, 1913, the company sold $5,000 of tungsten lamps in addition to 300 flatirons, twenty-three vacuum cleaners besides many vibrators, percolators, etc.

The change to 110-volt a.c. distribution also made it possible for residents of Charlottesville to bring such items from other cities without finding them useless on the local circuits. The number of arc lamps, including the city contract, was increased from 106 to 140. In short, in one year, the power and lighting business grew from $18,541 to $36,176.

A detailed study showed 1863 electrical possibilities in all, and of this number the company now has 1006. Only one solicitor is now needed, and six wiremen, with helpers, are constantly employed to wire houses. One of the advertisements which the company uses to call attention to the advantages of electric lighting is a bill file, the front of which is made in the form of an incandescent lamp and bears the words "Is your house wired?"

Among the latest customers of the company is a lumber mill with 135 hp, a woolen mill with 140 hp and a silk mill with 40 hp in motors.

The business-like methods adopted for handling lighting and power accounts have also been applied to the railway service. It is a fact that at least 20,000 deadhead rides were given in the year before the present management took hold. Free service has been eliminated with absolutely no grumbling because the improvement in the service is so evident that no fault-finders can get a hearing from the public. For the year ending July 31, 1913, the railway carried 892,055 passengers. The gross earnings from the railway service are now more than $15,000 per mile of track installed.

The company co-operates wherever possible in all measures brought forward to advance the interests of the community, and has taken a leading part in the Charlottesville Chamber of Commerce. Through personal solicitation the membership of this body was increased from ninety to 308 in one year, and funds were collected to pay for a secretary who would devote all his time to progressive publicity for Charlottesville. As a last word, it may be said that the relations of the company with the public are very pleasant indeed, for the people appreciate the enterprising spirit that has furthered the promotion of Charlottesville's general welfare by giving the town a high-class public utility service.

The present ownership and management of this property comprises the following: President, F. C. Todd, Baltimore, Md., manager Baltimore office, General Electric Company; vice-president and manager, John L. Livers, Charlottesville, Va.; secretary, E. E. Starke, Charlottesville, Va.; treasurer, Norman James, of the N. W. James Lumber Company, Baltimore, Md.; general superintendent, Custis L. Carter, Charlottesville, Va.; R. H. Fife, superintendent of construction, and Geo. H. Smith, in charge of wiring and supply department.

Mooted Principles in Valuation

Abstract of Address Delivered by Hon. Frank W. Stevens, Chairman of Valuation Committees, New York Central Lines, Before A. E. R. A. at Atlantic City—Discussion of Distinctions Between Valuations of Public Utilities for Different Purposes

At the Tuesday afternoon session of the American Electric Railway Association convention at Atlantic City one of the leading addresses was that delivered by Hon. Frank W. Stevens, chairman of valuation committees, New York Central Lines, on the subject of "Mooted Principles in Valuation." An abstract of this address, which on account of its importance was held over until this issue for more extended treatment, is published below:

It is exceedingly extraordinary that valuation should be called a mooted question, yet the fact remains that it is. The valuation of public utilities has been carried on for a considerable number of years in this country, but with very little reference to the foundation principles upon which valuations should be conducted.

Opinions on Return on Bona Fide Investment

At a hearing before the interstate commerce committee of the House on Feb. 15, 1912, Commissioner Clements of the Interstate Commerce Commission testified that it was "sound justice and law that, as a basis for constitutional earnings, a fair return on the value of the property means, generally speaking, a fair return on the investment actually made, originally and subsequently." Investment means simply the money that the stockholders have taken out of their pockets or borrowed and put into the business.

The same question was raised before the Senate committee, when Commissioner Meyer said: "But there is an element, and one upon which, if the Interstate Commerce Commission is to make this investigation, you will have to give us some instructions—namely, how to keep property that was originally donated, and what to do with the advance in the value of railway property caused by the development of the community. These questions are directly involved in the question of physical examination." The proposition to which Commissioner Meyer alludes is that the property which was originally donated to the public service corporation was not entitled to any return in the rate whatsoever, and also that appreciation of railway property should not be recognized. This goes back directly to the investment proposition.

The principal witness before the Senate committee on interstate commerce, who was chiefly instrumental in framing the present valuation act, was Prof. John R. Commons, of Wisconsin. At Professor Commons' suggestion, the form of the act was expressly made to allow the Interstate Commerce Commission to pass upon the very questions now being discussed. Professor Commons said:

"The amount of value on which this company is entitled to earn a profit is the amount of its real or reasonable investment, the amount which the owners have taken out of their pockets, and which they might have invested elsewhere under fair competitive conditions and secured themselves a fair competitive return. But if the public has paid a higher rate and that higher rate has gone into the new construction of physical property, that excess in the inventory value of the physical property does not represent a grant on the side of the company against the public but represents a contribution which the public has made to the physical property."

As long ago as 1910 in the advance rate cases before the Interstate Commerce Commission, both in the Western case and in the Eastern case, the commission itself spoke on these subjects. In the Western case Commissioner Lane said:

"Perhaps the closest approximation to a fair standard for the basis upon which to compute the return allowed to public service corporations is that of *bona fide* investment, the sacrifice made by the owners of the property, considering as part of the investment any shortage of returns there may have been in the early years of the enterprise. By thus taking the life history of a road through a number of years, its promoters are entitled to a reasonable return."

This return, however, is expressly limited, for it is provided that no return shall be given on wastefulness, mismanagement or poor judgment, there always being the restriction that no more than the reasonable rate shall be charged. Thus in the same case the commissioner said: "It would appear that one of the problems of the future in railroad regulation is to discover the machinery by which the railroad may justly take to itself an adequate return for the investment made by its stockholders and also share with the community the advantage of the surplus which it creates."

In the Eastern case, Commissioner Prouty made the following remarks:

"The president of the Pennsylvania Railroad testified that since 1887 his company had put into the Pennsylvania lines east of Pittsburgh $262,000,000 from earnings. During all that time this company also paid its stockholders munificent dividends. Now, to whom belongs this $262,000,000, a sum which, according to the statistical report of the Pennsylvania Railroad to this commission for the year ended June 30, 1910, equals nearly two-thirds of the cost of construction of the 2123 miles of railroad owned by the company?

"Should there not be some distinction made between this sum which has accrued from the operation of the property and the amount which has been paid in from other sources? We are not required at this time to express an opinion on this point."

Questions at Issue

The above statements and extracts from opinions call serious attention to a matter which has many advocates—namely, the opinion, first, that a public service corporation should not be allowed to earn any return upon property originally donated to it; second, that it should not be allowed to earn any return upon property paid for out of earnings, assuming, of course, that during the time when these earnings were accumulated the company was earning a reasonable dividend upon its actual investments; and, third, that the public service corporation should not be allowed to earn any return upon appreciated values, or, as sometimes stated, though unfairly on account of the implied assumption, upon the "unearned increment."

Legality of Return

These questions, of course, may be approached from two points of view: First, is the proposition here indicated correct and proper economically? Second, do

such questions constitute the law of the land? On account of the limited time at my disposal, however, I shall confine myself to the legal proposition as to whether or not these elements of value, donated property, property paid for out of earnings, and appreciation of property, are such that under the law of the land we are entitled to have earnings upon them.

Courts Final Judge of Reasonable Rates

The fixing of rates by legislative authority for corporations which had theretofore been entitled under the law to fix their own rates began in this country in the seventies. Among the first cases upon the question as to whether any such legislative power existed was the Munn case arising in Illinois. The United States Supreme Court in that case, after long argument, held what is now universally recognized, that legislatures (and now their delegated agents, public utility commissions) had that power, subject to the condition that the rate fixed must be a reasonable rate.

This, of course, left the matter very largely up in the air, because the test would be required at once—what is a reasonable rate? And a more important question at the outset was: Who has the final power to determine what is a reasonable rate? The Supreme Court in the first instance declared, practically, that the final power of passing on the reasonableness of the rate was a legislative and not a judicial power. This proposition was repeated in subsequent cases and was always held, with some dissent, which kept growing with changes in the court personnel, until 1889. In this year, in the case of the Chicago, Milwaukee & St. Paul Railway versus the State of Minnesota, the court changed its first view and decided that it did not lie in the power of the legislature of any state, or the Interstate Commerce Commission, or Congress to pass the last word upon the question whether a rate was reasonable or unreasonable, but that it did lie with the courts.

Now, upon what theory? It was held in the above and subsequent cases, that the power of the court in that final question was to be exercised and could be exercised for one purpose only, and that was to prevent a confiscation of property. Until legislative action resulted in a rate so low as to mean confiscation, the courts could not interfere. The case of Reagan versus the Farmers' Loan & Trust Company is a very celebrated case on this point. In this case the court said that "While it is not the province of the courts to enter upon the merely administrative duty of framing a tariff of rates for carriage, it is within the scope of judicial power and a part of judicial duty to restrain anything which, in the form of regulation of rates, operates to deny to the owners of property invested in the business of transportation that equal protection which is the constitutional right of all owners of other property."

Further citations are unnecessary to show the functions of the courts with reference to rate-making. The courts have no power to make any rate. They have no power within certain limits to interfere with any rate that is made by a public service commission or by a legislature. They have the power, however, when the rate reaches such a point as to be confiscatory in its practical working, to interfere, because property is protected against such assaults. The great and important question in every rate case that comes before the courts, therefore, is this: What is the property of the corporation? Whatever this property may be, as it is recognized by law, it must be protected by the courts.

The case, then, practically comes down to this: Are items which are in the nature of property—that is, property which has been donated, or which has been paid for out of earnings, no matter whether the returns were excessive or not, or property which has increased in value or appreciated—are those elements of property in the hands of the corporation? If they are, they must be protected against confiscation, the same as any other property. If they are not, then another question arises.

Fair Value of Property

The first case in which the question came before the Supreme Court as to the standard to be adopted in determining the reasonableness of a rate, was Smythe versus Ames. At that time all sorts of theories were propounded as to the basis upon which a rate was to be judged. It was argued on behalf of the state that if the property was allowed to earn anything above operating expenses and taxes, the courts could not interfere, and that the measure or the amount of the return was wholly a matter of local state policy. It was also argued by the state that, if this previous contention were not allowed, the company should only be granted a reasonable return not exceeding the rate of interest, upon the reproductive cost of the property. The railroads contended, however, that they were entitled to earn not only the operating expenses and taxes, but also interest upon their bonded indebtedness and a dividend upon the amount of stock outstanding. There were the two poles. The court said that neither of the contending parties were right, and that the basis for the calculation of rates was the fair value of the property.

Ignorance as to "Value"

But now we come to the question which in one sense is amusing and in another sense deplorable. During the seven years when I have been personally engaged in the investigation and consideration of this question, I have scarcely ever been able to find out what anybody thought of the term "value." Since my connection with practical operations under the recent valuation act, hundreds of men have professed to me to be entirely ignorant of what was meant by "value." Such a condition, after the organization of business for thousands of years upon a property basis, is a source of astonishment.

If the value of the property is to be protected, the question must arise how theories such as those laid down by Professor Commons and Commissioner Clements can work. They seem to regard it to be a self-evident proposition that the Supreme Court can change the definitions of value to include or exclude classes of property. This may seem to be an extraordinary statement, but it is not made without proof.

Professor Commons' Opinion

Professor Commons, who is an able man and a profound student, but all of whose statements I do not indorse, says:

"The Supreme Court has really been working out a theory of value in the last forty years, since the Munn case, and has very materially recast its old conception of what constitutes value. The fundamental basis of the court's contention is not market, competitive or actual value, but rather a fair, reasonable or just value. The court recast its theory of value in rate-making cases because it perceived that in setting up a value for the property it created substantially a creditor and debtor relationship, the owners of the property being in the nature of creditors and the public in the nature of debtors for something devoted to their service.

"From 1889, the time of the Chicago & Milwaukee case, down to the present time, the latest cases being the Consolidated Gas case in New York, the Knoxville Water case and possibly one or two more recent cases, the court has been making a transition. It has been shifting its ground as to what is value or valuation, or the amount of value for rate-making purposes. The

valuation bill should provide for the original cost to date, in order that the court may have before it the facts, and the amount of differences involved in the different methods of valuation. The securing of original cost and present value would make it possible for the court to consider whether a railroad is entitled to appreciation in its land values, equivalent to the appreciation which private owners adjoining them have enjoyed. My own idea is that if the case were properly presented to the court, the court would adhere to the idea of reasonableness throughout, and would recognize that for rate-fixing purposes this property, being devoted to a public use, was entitled to a return on the actual reasonable investment cost of the property only."

PRESENT PROBLEM OF VALUATION

A very serious question confronts all owners of public service property at the present time. It is being gradually worked out through the valuation act whether or not there can be two kinds of value attached to the same article of property; a value for taxation or a value for sale and another value for rate-making purposes, the last value being one which would exclude the three classes of property previously mentioned as well as others. The only protection which carriers have for their property lies in the definition of the word "value." If theorists, if commissions, if legislatures, if courts can make a definition of "value" to fit the case, then it is just as possible for the Supreme Court or any other court to confiscate utility property as it is possible for a commission or a legislature to do so, and if by changing the definition of the word "value" they can exclude donated property, as Professor Commons seems to think they can, or property paid for by earnings, or appreciation of property, they can confiscate that part of the property by denying any return upon it, for such a procedure is nothing more nor less than confiscation.

MEANING OF VALUE

The first mooted question in valuation, therefore, is: "What is value?" A definition for this cannot be manufactured by the individual any more than by the courts. It is embodied in the language. "Value, in exchange, expresses nothing but a ratio, and the term should not be used in any other sense." Value, in the sense that we are using it, is always expressed in terms of money. What determines this ratio? Nothing more or less than the mental condition. Scores of definitions all run to the same proposition, but in the discussion of this question, inasmuch as the Supreme Court of the United States has the final word upon all these subjects, its opinion is most valuable as to what constitutes value.

From a collection of eight cases before the Supreme Court on the subject of rate making, there has been prepared the following summary:

1. There is not an intimation in any one of the cases that the court is using the term "value" in a sense different to that given to it in condemnation and taxation cases.

2. It has declined to hold that the cost is the value of the property, although consistently holding that it is an element which must be considered in fixing value.

3. It has decided that when property or rights are owned in fact, it is immaterial whether the owner paid anything for them or not. Their value must be respected in fixing the rate.

4. It has decided that in ascertaining the present value it is not limited to the amount of the actual investment; that the making of a just return for the use of property involves the recognition of appreciation in value.

5. It has declined to hold that cost of reproduction is necessarily the value of property.

6. It has held that cost of reproduction is one way or method of ascertaining value. It does not follow, however, that any article may be worth the cost of reproduction or that obsolete property which must be thrown out of use is not worth the cost of reproduction.

7. It has held that a variety of matters are to be considered in fixing value.

8. It has decided that the ascertaining of the matter of value is the exercise of a reasonable judgment having as its basis the proper consideration of all relevent facts, which, of course, is the very element of value in exchange.

RECENT DECISIONS

In the Minnesoa rate cases decided last year, it was pressed upon the court in argument that where a right-of-way has been donated free of cost it should not be included in the aggregate amount upon which to base a return; that lands secured under the right of eminent domain should never be valued at more than the original cost, and that lands procured or purchased from earnings should not be included in the value of the property. The court, however, used this language in reply:

"It is clear that in ascertaining the present value we are not limited to the consideration of the amount of the actual investment, as the company may not be protected in its actual investment if the value of its property be plainly less; so the making of a just return for the use of the property involves the recognition of its fair value if it be more than its cost."

Hence, if the court adheres to principle and its own declarations, the appreciation of property must be recognized as a part of the value. In the most recent case which has come before the Supreme Court, San Joaquin County versus Stanislaus County, 233 U. S. 454, the court held expressly that whether the water rights in question cost the company anything or not they owned them. They were property, and the company was entitled to a fair return upon them. This, then, disposes entirely of the question about donated property.

CONCLUSION

The answer to the question stated at the beginning is this: There cannot be, in principle, two kinds of value, for value is simply a relation between the article valued and money, and there cannot be two relations of the same thing to money. The courts have, in taxation and chiefly in condemnation cases, laid down certain rules regarding property, and property which is donated, acquired from earnings or appreciated, must be recognized as part of the total value. If they are not recognized in rate-making cases, those elements of value are certainly confiscated. Certain well-meaning gentlemen who entertain a view of the economic side of the question far different from what I do maintain that the courts have tried to do this. I have tried to show that the courts have done nothing of the kind. They maintain that the courts can do it. I maintain that the courts cannot do it, because as soon as they do, in a case where they have jurisdiction solely for the purpose of protecting property against confiscation, they thus put a definition to value other than that which they set in condemnation cases, and actually confiscate that part of the property which is not recognized by the new definition.

The Hagerstown & Frederick Railway recently adopted the plan of distributing as souvenirs to the patrons of Braddock Heights Park, Md., a large number of hatpins, the heads of which are buttons, similar to those worn by the trainmen of this line. The design, which was originated by S. H. Bennett, auditor of the company, is very attractive, bearing the words "Heart of Maryland Route." These souvenirs, while inexpensive, proved good drawing-cards at the park, and the demand for them exceeded the supply.

Proceedings of Friday's Session of the Engineering Association Meeting

The Concluding Session of the American Electric Railway Engineering Association was Mainly Occupied with Discussion of Way Matters—L. P. Crecelius was Elected President of the Association

The final session of the Engineering Association opened Friday morning with President Hanna presiding and a representative number of engineers in attendance. The first order of business was the report of the committee on way matters which was presented by Mr. Kimball.

Foundations in Paved Streets

R. C. Cram, Brooklyn, N. Y., in opening the discussion of the question of the proper foundations for track in paved streets, emphasized the fact that there were practically only five types of track construction in general use in this country, the sixth type shown in the illustrations accompanying the report being comparatively new. While the committee did not take into consideration all the minor variations in the different designs obtained in response to requests for data, the four types recommended are representative of those followed with more or less success. The crux of the track situation is how much money can railways afford to spend. There are advocates of all types, but the problem resolves itself into one of the most economical designs to fit the service given.

C. R. Harte, New Haven, discussed loads on soil particularly. He brought out the fact that there was little or no information upon which accurate calculations could be made since different soils act differently under varying conditions. In a good many instances the calculated bearing power of the soil is exceeded without serious results. Unquestionably confined soils have a greater bearing power than the same soils unconfined. When the problem is one of improving the bearing qualities of soil, undoubtedly drainage offers the best method while it is possible to obtain fairly good results with a filler or dryer.

Geo. L. Fowler, New York, referred to the information in the reports regarding the results of deflectometer tests conducted by the Chicago Board of Supervising Engineers, particularly referring to the fact that this test did not indicate that the rail raised the load. He also stated that the actual stresses in track were an unknown quantity and practically no records were available. The distribution of the loads over the subgrades largely depends on the quality of material used for ballast. He also made several references to some steam railroad experiments conducted to determine track stresses.

In explanation of the results of the deflectometer tests it was stated that this track was on 9-in. 129-lb. girder rail laid on concrete foundations. Consequently, it was more or less rigid and wave motion was eliminated. C. H. Clark, Cleveland, next replied to Mr. Fowler's theoretical conclusions regarding track stresses by stating that steam railroad traffic conditions did not apply to street railways in paved streets. Street railway traffic is slow-moving, consequently the resulting stresses were not comparable. Pavement maintenance is the most important factor entering into track construction in paved streets. Consequently the most rigid construction produced the best results. President Hanna qualified Mr. Clark's statement, however, by stating that it was impossible to make track absolutely rigid.

E. M. T. Ryder, Third Avenue Railway, New York, suggested that the use of a 7-ft. tie instead of the 8-ft. tie shown in the standard designs aided in reducing the track allowance and this turn resulted in lower construction and maintenance costs. In reply to this suggestion, Mr. Cram stated that the committee's idea in recommending a 6-in. x 8-in. x 8-ft. tie was to furnish a fixed bearing area. So long as the bearing area was maintained the tie lengths and widths could be varied to suit any engineer's ideas.

T. K. Bell, Ardmore, Pa., stated that street railway traffic conditions were not similar to steam railroads, consequently street railway track studies must be made along independent lines. In the past the concrete-beam track construction was popular, but the experience of those using it indicated that it was not good practice—in fact, in many instances it accounted for new difficulties such as rail corrugation. Mr. Bell also referred to foreign practice in making track construction more flexible, calling particular attention to the use of a bitumen layer beneath the rail to reduce noise and provide a more elastic track foundation.

C. H. Hile, Boston, stated that in his experience the present tendency was toward more flexible types of track construction. The element of noise is becoming of considerable importance in a large number of large cities and flexibility seems to offer the solution. In fact, he stated that the question was now up in Boston and a committee had been appointed to make a thorough study of the subject.

Mr. Dodge said that his company was using the concrete-trench type of track foundation with considerable success. It had adopted wood block for pavement because of its improved wearing qualities and noise reducing characteristics.

At this point in the discussion President Hanna suggested that a motion would be in order to approve the recommendation of the way committee or those of the standards committee. After the motion had been put and seconded, Mr. Schreiber stated that it was the standard committee's belief that it would be unwise for the association to adopt these designs as recommended practice, because of the reasons set down in the standards committee report, since some of the designs did not represent the best modern practice. In order that there would be no misunderstanding of the standards committee's action, it was stated that its purpose was to accept the designs as a whole or recommend that they be turned back for further consideration if it disagreed with some of the details. President Hanna stated that he believed that these designs represented the best types in general use to-day and should be so considered.

In explanation of some points raised in the discussion, Mr. Cram stated that the committee was undecided as to the correct assumptions for the soil bearing qualities. Improper drainage unquestionably reduces bearing power of soils, consequently elimination of moisture is of prime importance. Another phase of the subject which should receive consideration was the character of traffic and the fact that it could not be diverted entirely during the construction period. In practically every city it is necessary to build track

under service. Consequently the type of construction adopted must permit this practice. Regarding the use of solid concrete construction, Mr. Cram stated that some of the largest companies in the country had adopted it as standard. It had to be included as a recommended design. The European practice in constructing tracks in paved streets offered a number of features well worthy of careful consideration. In closing he stated that the track chapter in the 1913 convention issue of the ELECTRIC RAILWAY JOURNAL had served as the basis for the early stages of the committee's work.

The report of the committee as to track foundations in paved streets was referred back in accordance with the recommendations of the standards committee.

T-RAIL IN PAVED STREETS

T-rail in paved streets, the second subject considered by the way committee, was presented by Mr. Graves and discussed by Messrs. Clark, Wilson, Cram and Bell. It brought out the fact that those using T-rail did not believe that it was limited to any traffic conditions excepting special work where it was undesirable from a pavement maintenance standpoint. It was also stated that in many cities its use or its non-use was attributed to the action of city authorities who specified the rail section to use. A recommendation of considerable importance in favor of the use of T-rail was its tendency to clear the track for vehicular traffic. The report of this sub-committee was received as information.

W. F. Graves, Montreal, suggested that it might be well to recommend to way engineers that comparative records be kept to show the cost of maintaining paving with girder and T-rail construction respectively.

Mr. Hurd, Universal Portland Cement Company, said that an investigation had recently been made in several Western states covering 20 miles of track with concrete paving. He highly favored such construction. As evidence of the complete bond thereby maintained between the rail and pavement, he mentioned the simultaneous breakage of a 7-in. welded girder rail and the cracking of the adjacent paving at Fond du Lac, Wis.

In conclusion Mr. Cram stated that the specifications for concrete pavement distributed at the meeting by Mr. Hurd might give the impression that they had been issued or approved by the committee on way matters. This was not so. The committee had not mentioned any pavement whatsoever. Therefore, this was simply a suggested unofficial specification for paving to go with the committee's proposed type D construction.

OTHER MATTERS

The next order of business was the report on heavy electric traction, which was presented by the chairman, E. R. Hill. The report was duly accepted.

C. R. Harte then presented the report of the committee on resolutions in which thanks were extended to the president, the other officers and the committees for the excellent work they had done during the year. Thanks were also extended to the Manufacturers' Association for its splendid exhibits and assistance to the committees. Mr. Harte then presented a resolution that the executive committee be requested to consider the appointment of a necrology committee to prepare memoirs of members upon their death. The report and motion were duly accepted.

The report of the committee on nominations was then presented by Martin Schreiber as follows: President, L. P. Crecelius, electrical engineer, Cleveland Railway; first vice-president, John Lindall, superintendent of rolling stock and shops, Boston Elevated Railway; second vice-president, B. F. Wood, chief engineer, United Gas & Engineering Company; third vice-president, F. R. Phillips, superintendent of equipment, Pittsburgh Railways; secretary and treasurer, E. B. Burritt. Executive committee: J. P. Barnes, general manager, Syracuse & Suburban Railroad; G. W. Palmer, Jr., electrical engineer, Bay State Street Railway; H. F. Merker, engineer maintenance of way, East St. Louis & Suburban Railway; W. G. Gove, superintendent of equipment, Brooklyn Rapid Transit System. The secretary was instructed to cast one ballot, and the gentlemen named were duly elected.

Retiring President Hanna expressed his thanks to the members for their cordial co-operation that he had enjoyed during his administration, and also expressed his thanks for the assistance given by Messrs. Burritt and Stocks at Association headquarters. President-elect Crecelius was then inducted to the chair. Mr. Crecelius thanked the members for his election saying that the honor was one that he greatly cherished. On motion the session was then adjourned.

ATTENDANCE AT THE CONVENTION

Up to Thursday night 2450 persons had registered at the associations' headquarters. This is a reduction of 20 per cent from last year's registration of 3085. There were 1400 railway men, 464 or 25 per cent fewer than last year; and 1050 supply men, 171 or 14 per cent fewer.

CORNELL ELECTRIC RAILWAY REUNION LUNCHEON

Following the precedent established last year the Cornell men in attendance at the Atlantic City convention held a get-together luncheon. At 12:30 on Thursday thirty or more railway and supply men lunched together informally at the Marlborough-Blenheim. Before lunch was served each man rose in turn and stated his name, class and present occupation. Ernest Gonzenbach, general manager Empire United Railways, and E. J. Dickson, vice-president International Railway, attended as guests. A permanent reunion committee was appointed as follows: Fred. L. Wright, vice-president Wm. Wharton, Jr., Inc., Philadelphia, Pa., chairman; W. K. Archbold, president Archbold-Brady Company, Syracuse, N. Y.; C. H. Clark, engineer maintenance of way Cleveland Railways, Cleveland, Ohio; T. M. Farmer, Jr., vice-president Consolidated Car Heating Company, New York; H. H. Norris, associate editor ELECTRIC RAILWAY JOURNAL, New York, and Lee H. Parker, Stone & Webster Engineering Corporation, Boston, Mass. Mr. Wright desires the names of all Cornellians engaged in electric railway work.

A meeting of secretaries of technical societies has been called for October 31 at the United Engineering Societies Building in New York to consider the formation of a Society of Technical Associations' Secretaries. This is the outgrowth of a movement which has been under development for some time as a result of the increasing necessity for co-operation in society management. The number of technical societies is now so great that some simple method of preventing conflict of dates of meetings, scope and plan of work, etc., seems to be imperatively needed. The objects of the proposed association will not be definitely defined but they are comprehended in a suggested phrase as "the development and solution of problems of mutual interest to the service of its members." The call for the meeting is signed by the secretaries of the following societies: American Institute of Electrical Engineers, American Society for Testing Materials, American Society of Mechanical Engineers and American Institute of Mining Engineers, and American Institute of Chemical Engineers.

Reports Presented at Concluding Session of the Engineering Association

The Committee on Way Matters Reported Extensive Data Based on a Comprehensive Canvass of the Association Membership—The Committee on Heavy Electric Traction Presented a Brief Report—Abstracts of the Reports are Given Below

The report of the committee on way matters of the Engineering Association, presented yesterday, covered: Proper foundation for tracks in paved streets; use of T-rails in paved streets; pavement for use in connection with girder and high T-rails, and alloyed steel rails. The report showed that the basic principles followed in the study of track foundations in paved streets were permanency and the features which influenced it. Permanency is of prime importance to electric railway tracks in paved streets, where, as a rule, the types of pavements found are costly, and both the railway and street traffic are heavy, making repairs difficult and expensive. After a careful study of all the factors influencing the design, the committee concluded that the question of proper foundations for track in paved streets required a most careful study of the soil in the street with respect to its bearing value.

Dependable data regarding the bearing values of various surface soils were somewhat meager, but sufficient information was found to allow the committee to recommend designs of foundation construction for adoption. The bearing powers of the soils, shown in the following table, were taken into consideration:

Material	Safe Load in Tons Per Square Foot
Quicksands and wet soils	0.1 to 1.0
Dry earth according to depth below surface	1.0 to 3.0
Moderately dry clay, confined	2.0 to 4.0
Dry, stiff clay	4.0 to 6.0
Sand, confined	2.0 to 6.0
Sand, compact and cemented	4.0 to 8.0
Gravel, cemented	8.0 to 12.0
Rock	25.0 to 200.0

As a result of a study of the track-drainage problem, the committee found that much soil which was considered unfit for roadbed without some form of concrete foundation may be rendered serviceable by the installation of a suitable subsoil drainage system. In this connection it was also concluded that heavy clay soil which retains moisture for long periods required subsoil drains regardless of the type of foundation used. To give an idea of the percentage of moisture retained by certain soils which would prove of value in determining what drainage arrangements were necessary, the following figures were given: Pure clay, 70 per cent; clay loam, 50 per cent; loamy soil, 40 per cent; sand, 25 per cent.

It was also found that the character of the foundation was closely related to the question of electrolysis, being to a certain extent a determining factor of the leakage of stray currents. A well-drained rock or concrete roadbed may, in general, be expected to offer much higher resistance to leakage current than one in which a large amount of moisture is retained. Another factor in obtaining good foundation drainage is the installation of surface drains and a pavement which will prevent the infiltration of surface water.

Information gathered from the data sheet tended to show that the practice of rolling the subgrade and ballast was increasing, and the committee recommended that rolling should be done wherever practicable under working conditions, if warranted by the kind and condition of the subsoil. Rolling is especially recommended where the street is known to be on made ground, or where there has been much disturbance of subgrade due to foreign subsurface constructions and cross trenches. Where it is impracticable to roll, the subgrade should at least be thoroughly rammed so as to eliminate soft spots, and the ballast thoroughly tamped by hand or by operating loaded cars over the track, the tamping being continued until there is no movement observed under load. In some instances, a subballast of cinders, placed under the crushed stone or gravel ballast, may be used to advantage. This is particularly true where it is desired to increase the depth of the ballast without greatly increasing the cost of ballasting materials.

In order to eliminate the misunderstanding as to the meaning of the term "permanent track construction," the committee made the following explanation: A track may be called permanent when it is built to the established line and grade in a street, wherein all customary foreign sub-surface structures are in place and the permanent pavement of the street has been installed, or will be constructed, immediately following the track construction. A permanent track also is one designed with the object of securing the minimum maintenance cost and the maximum life from the several materials involved when subjected to mechanical wear, action of the elements and harmful disturbances not under control.

The principal items to be considered in the design of track structures in paved streets were stated to be as follows: Character, bearing power and drainage of sub-soil; loads to be carried; form of sub-structure necessary to distribute the loads over the sub-soils; form of superstructure to be carried by the sub-structure; the character of the street improvements with respect to line, grade, sub-surface structures and paving, and the traffic conditions under which the work is to be executed.

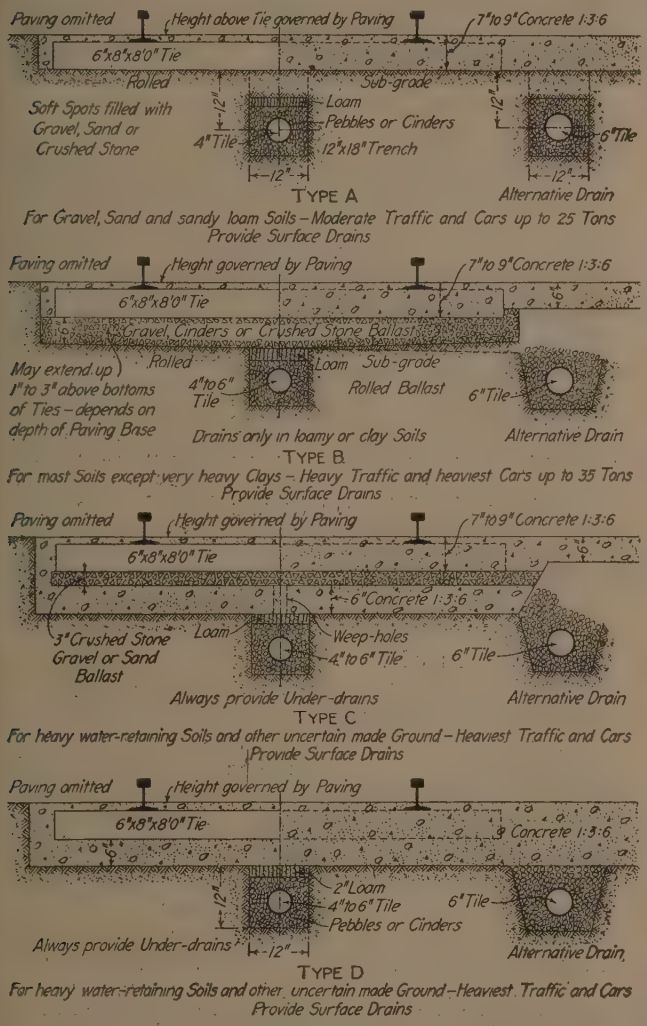
Information gained from the data sheets indicates that only 20 per cent of the eighty roads reporting on the subject of ballast use concrete ballast construction. While this may be somewhat misleading since it is not on a mileage basis, it is an indication of the preference. When it is also considered that some of the largest properties are abandoning concrete construction in favor of either stone ballast or the more resilient concrete sub-ballast construction, it appears that current practice is not generally in favor of solid concrete.

Two general conditions usually are confronted in constructing track in streets, the one where most of the improvements are yet to be made, such as in new extensions through recently developed territory, and the other where all the expected improvements have been made or will be completed within a very short time. Under the first condition it is not generally advisable to install a standard permanent type of construction, but a temporary type which can be removed before a full life is reached should be used. Where the improvements are in, it is desirable to install a standard construction suited to the conditions obtaining, and such construction should preferably be entirely new in order to obtain a maximum life from all its component parts.

In order to obtain uniformity in designing methods,

the committee adopted a standard track loading to be used. It is believed that the load produced by a 50-ton car supported on eight wheels with 25-ft. truck centers, and 5-ft. wheelbase should be adopted. In considering soils a load of 1.5 to 1.75 tons per square foot should be used, and the soil should be assisted in performing its whole duty by adequate drains.

As a result of its study of all the factors which might influence the various designs of track foundations in paved streets, the committee submitted four types of foundation construction for adoption as recommended designs. These are shown in the accompanying illustrations. Sub-soil conditions largely govern the selection of any of these four types. It was inferred, however, from the information at hand that the soil generally found in city streets was in the original state, or if it has been in place for many years, afforded sufficient strength in the sub-grade to sustain the average



COMMITTEE ON WAY MATTERS—RECOMMENDED FOUNDATION CONSTRUCTION DESIGNS

loading, provided the loads are distributed through a moderate amount of crushed stone, gravel, or even cinder ballast.

This report on track foundation also contains a tabulation of the characteristics of track construction in North America as reported by seventy-eight cities; a bibliography of proper foundations for track in paved streets; an article describing foreign street railway construction, and an appendix containing definitions of the various terms used in describing roadbed, track, ballast and ballast materials.

USE OF T-RAILS IN PAVED STREETS

T-rails in paved streets received the thorough consideration of the committee having this subject in hand. After analyzing what had been done since the first committee on this subject was appointed in 1907, it was deemed advisable to consider the points for and against the use of T-rails in paved streets. The chief points in favor of its use are as follows: First, the T-rail is generally considered to be designed on better mechanical lines. Second, more satisfactory mechanical joints can be manufactured, partly because of the symmetry of the rail outline. Third, the flangeway is more suitable for different wheel flanges. Fourth, the rails have a longer life as a rule, under equal traffic, with a lessening of street openings for renewals. In theory the life of the ordinary joints is probably longer, with a lesser amount of disturbance of pavement at the joint. Fifth, many installations of T-rail in paved streets in recent years have satisfactorily met the local conditions. Several cities have required the adoption of high T-rails in replacement of tram and girder-grooved rails. Sixth, much objection has been improperly directed against T-rails when it should have been brought against the pavement. This has been proved by the installation of modern pavements with old high T-rails.

The points against high T-rails are as follows: First, it is more expensive per foot of finished track and pavement. Second, the lack of a self-cleaning flangeway. Third, increased wear of pavement adjacent to rails, under extreme traffic conditions, resulting in high paving maintenance. Fourth, it is apt to offer a greater resistance to vehicular traffic. Fifth, difficulty in preventing seepage of water in flangeway.

Replies to data sheets sent out by this committee show that at least nineteen different types and arrangements of paving between the gage lines of T-rail tracks are in general use. The total trackage of the companies included 2241 miles of T-rails of all sections, of which 1086 were represented by rails of 6 in. or more in height. From these data sheets a tabulation of the paving used between the rails is as follows:

	Miles
Concrete	19.48
Asphalt	404.19
Slag brick (scoria)	49.67
Macadam	86.05
Granite blocks	635.85
Wood block	84.41
Brick	724.93
Bituminous	37.27
Asphalt block	2.88
Other pavements	196.24
Total	2240.97

On the question of cost of maintaining pavements in T-rail track construction, very little accurate information was obtainable. The tendency throughout the replies, however, indicated that the cost of maintaining paving along T-rail was somewhat greater than girder rail, but that this was offset by the T-rail's improved wearing qualities.

As a result of its study of the data sheets the committee reached the following conclusions: First, there is a diversity of opinion among member companies regarding the use of T-rail in paved streets. Second, that granite or brick headers along the gage lines and under the head rails are most generally used. Third, that Portland cement grout or asphaltic cement grout is the most desirable means of filling the space next to the rails. Fourth, that the tendency of vehicular travel to follow the tracks is about as heavy with T-rails as with other kinds of rails. As a general proposition, the committee could not recommend the use of T-rails for all conditions, and it believed that the limiting conditions were usually reached in the congested portions of city streets. It also recommended that when T-rails are to be laid in permanently paved streets, they should be 7 in. in height, in order to permit satisfactory pavement construction.

Pavement for Use in Conjunction with Girder and High T-Rails

Although the committee was not able to give this subject the consideration it demanded and recommended that its work be continued during the ensuing year, some valuable data were collected and presented regarding the need for traffic records. The report stated that records of this kind were of utmost importance and utility to engineers connected with construction, maintenance and use of streets, and particularly in arriving at a recommended practice for the pavements to use with girder and high T-rails. Since there was no standard method of recording and comparing traffic on streets of the same city or in different cities, the committee endeavored to suggest a uniform method of recording, analyzing and standardizing quantity and weight of traffic on a unit basis.

As a result of their study, the committee decided that the records should be based on simple, accurate methods of counting, recording and reducing the traffic to standard units of quantity and tonnage. In addition this method should be such as to make it easily understood and applied. The period to be covered by any traffic count should be fourteen consecutive hours from 5 a. m. to 7 p. m. and during six consecutive or different week days. However, if average weather and traffic conditions are known and selected, the record may cover only three consecutive week days. Traffic counts should not be taken in abnormal weather, such as seasons of snow and ice, nor during continuous rainy, very hot or excessively cold days, and holidays. The count should be taken at or near the center of the block and not at street intersections and should include traffic both ways. Preferably the observer should be stationed in an elevated position, a second-story window facing the street being most satisfactory.

The committee also presented a general classification of vehicles for practical results as follows: Horse vehicles, subdivided into one-horse, two-horse, three- or more horse and motor vehicles. In computing weights, the horses as well as the vehicles must be considered, because both are factors in pavement wear. For record purposes the average weight of one-horse vehicles, empty and loaded, can be taken at one ton; two-horse vehicles, at two tons; three-horse or more at four tons. Similarly the average of all motor vehicles, empty and loaded, for transportation of persons and goods may be taken at one and three-quarter tons. Bicycles, motorcycles and saddle horses should be excluded A form of traffic counting slip was also designed and recommended by this committee.

Alloyed Steel Rails

This subject was merely a continuation of the review of the subject of alloyed steel rails begun by the committee on way matters in 1912. One of the most striking things observed in this study was that the tonnage of alloyed steel being rolled into rails of all sections has been declining for the last three years. The production of Bessemer steel rails also has been steadily declining, while the production of open-hearth rails has been increasing at approximately a corresponding rate. In other words, the indisputable tendency is toward the more general use of open-hearth rails, which tests have shown to have greater wearing qualities than Bessemer rails. On the other hand, while open-hearth rails cost 7 per cent more than Bessemer rails, purchasers are loath to pay any more to obtain the additional wearing qualities which would be furnished by an alloyed steel.

As a matter of general interest, however, the following table of special steels possessing the general characteristics mentioned, is shown:

Kind	Steel Containing	General Properties Anticipated
Titanium	0.1 per cent metallic titanium	Less segregation, cleaner metal, hence, longer life.
Nickel	3.5 per cent nickel	Increased life.
Nickel chrome	Containing varying percentages—nickel and chromium	Increased life by being tough and hard.
Manganese	About 12 per cent manganese	Very tough and hard, cannot be easily cut or drilled, wears slowly.
Electric	Made in electric furnace.	Very clean steel, free from impurities, thus adding life.
High silicon	About 0.35 per cent silicon	Increased life. Much used in England.

The four types of foundation construction submitted for adoption as recommended designs by the way committee were in turn submitted to the committee on standards. This committee recommended that the types be referred back to the committee on way matters for further consideration, since some of the designs do not, in the committee's opinion, represent the best modern practice.

Committee on Heavy Electric Traction

The report of the committee on heavy electric traction of the Engineering Association included a revision of the recommended designs covering clearances for overhead conductors, the revision consisting in a diagram giving a 15-ft. 3-in. clearance for overhead d.c. conductor rails. A continuance of the subjects of clearance lines for third-rails and of the study of modern electric locomotives was recommended for the ensuing committee. In connection with this report the committee on standards approved the proposed clearance for overhead conductors as a recommended design.

Appalachian Power Business

Much new business has been obtained recently by the Appalachian Power Company, Bluefield, W. Va. In talking with a representative of the Electric Railway Journal M. A. Viele, of Viele, Blackwell & Buck, consulting engineers of New York, who is vice-president of the company, spoke of the contracts for energy which have been closed recently.

The Appalachian Power Company began to deliver energy on Aug. 1, 1912. It has a large potential market in the southwestern part of Virginia and the adjoining section of West Virginia. In the last few weeks fifteen contracts have been closed with coal-mining companies. They had been pending for some time, and their final execution was made possible by the increased output of coal resulting from the new markets opened by the European war. The power company was not delivering energy to any of the coal-mining companies in this list on Sept. 1, but it will be delivering to all but one of them on Jan. 1, 1915. It is estimated by Mr. Viele that the gross revenue from these companies for the first year will be from $55,000 to $60,000, and that in 1916 it will be between $85,000 and $90,000. The total gross revenues of the company thus far in 1914 are about 15 per cent greater than in the corresponding period of the previous year.

The company is prepared to finance its construction requirements. Its securities were underwritten on a basis providing for the completion of the construction necessary for the use of the entire estimated output. A construction program was arranged which covers the period to June 30, 1916. The capital provided for construction purposes has been divided into regular amounts, and these have been expended in accordance with the program. The company, however, is ready to hasten its work and open more developments if the market for energy warrants this change in plan.

The Improvement Club—An American Institution

The Author Outlines the Evolution and Methods of Local Organizations Formed for the Purpose of Bettering Conditions, Including Street Car Service, in Various Sections of a City

BY W. T. BUCHANAN, PUBLICITY MANAGER, PORTLAND RAILWAY, LIGHT & POWER COMPANY

Ofttimes when sitting back of a mahogany desk, in a ten-story skyscraper, figuring out street car service in the hope of satisfying both the stockholder and the patron, a knock comes at the door and the secretary announces the presence of the president of the Skookum Street Improvement Club. As he enters the room you note that the lines of the visitor's face are rigid. He carries himself with an air of knowing just what he is after. Evidently he proposes to hit from the shoulder. You put on your best smile, grasp his hand and tell him that you are delighted to meet him. He begins with a complaint, maybe of the service—which is for more cars on Skookum Street, 10 miles from the business center—more often it is a demand, and once in a while it is a favor that he asks.

How familiar this mental picture must be to every president and general manager of a public utility when reviewing his own experiences with this wondrous individual—the "president of the improvement club." He is an American institution—the outgrowth of our boasted democracy, and his like is not to be found in any other country. His counterpart does not exist in Europe. He is indigenous to American soil. What consideration shall we give him in the general scheme of publicity to educate the masses to a better understanding of the aims and purposes of a public utility? The man who presides over a street railway company of any size will agree that this individual has a very important relation to its gross earnings.

Withal the president of the Skookum Street Improvement Club is a peculiar individual. Sometimes he carries a chip on his shoulder. He smilingly informs you that he has read Mellen's testimony as to the New Haven operations before the Congressional committee. He, if you take the trouble to inquire, will tell you that he recently perused an interesting article in *Hearst's Magazine* on "Municipal Ownership." He is familiar with *Everybody's*, the *Cosmopolitan*, and in a daily paper he is a constant reader of all items telling of the relation of the company with the politicians. He says he knows all about "the jokers" in the franchise—as told to him by some politician or by having read of them in the newspaper having a "punch." Not infrequently he is a believer in socialism. Ordinarily he is saturated with the dope of the muckraker. Sometimes he is amenable to reason, and occasionally he is fair and desirous of getting at the truth. Even then he often dreams that the presidency of the Skookum Street Improvement Club will land him into a fat and healthy political job. There are none to deny that this man is an important element in the public utility field. Every manager has met him time and time again, and each one has a different method of handling him.

How came this man into the commercial make-up of our country? He is a brand-new factor—his existence was not known thirty years ago, when the horse car was the only means of city transportation. In those days, if the car got off the track he was ready to put his shoulder to the back shield and help put it on the track. Now he makes a bee line for the president's office to make known his complaint.

The improvement club or association is really a by-product of the electric railway. It was the electric railway that brought within reach of the business section the suburban territory. Before that time the horse car would not permit of long street car lines as they exist to-day. In moving out along the electric railway the citizen found he needed paving, sewering and all the various conveniences of city life. Being somewhat isolated he found that his requests were not heeded at the city hall, and this led him to forming improvement associations. These associations linked their efforts with neighboring associations, and now nearly all large cities have even a central civic association composed of delegates from each of the neighborhood clubs.

The growth of the improvement clubs in all the cities of the country has been one of the marked characteristics of urban development. Some idea may be gathered from the following statistics as to the number of improvement clubs in Western cities.

Kansas City	112	Omaha	68
St. Louis	242	Minneapolis	181
Denver	64	Portland, Ore.	62
San Francisco	262	Seattle	73
Los Angeles	182	Dallas, Tex.	54
Milwaukee	150		

Think of 100 small organizations, in one city, acting as regulating bodies for whatever portion of the street car service that might take the fancy of the members of the clubs.

Have you ever attended one of their meetings? Usually only ten or twelve members are present. It appeals to the visitor as a sort of neighborhood affair. Hundreds of citizens living near the meeting place never attend and only know of the existence of the club through reading of it in the newspapers. If it is desired to secure additional cars, a new fender, a lower step, or a reduction of the fare, the modus operandi of starting the movement begins after this form. A meeting of the club is called. Ten members attend. A resolution is passed—perhaps it was prepared by the leader downtown in a lawyer's office—and with this resolution in the hands of a committee on which the president usually acts ex-officio he starts for the newspaper office and has it printed. "It's news," says the city editor, and that is sufficient dictum to send the stuff broadcast without regard to the truth of the claims set forth. Then comes another meeting of the club, fiery speeches are made, the newspapers print reports of them, and the campaign is on. What sort of action is needed to secure the co-operation of these clubs toward a sound and sane treatment of the community's most important business enterprise?

THE RECORD IN ONE CITY

It is a well-established fact that in cities like Milwaukee, Kansas City, Omaha and those on the Pacific Coast, practically all matters of a disturbing character start from the improvement club. Here is a list of new projects involving either capital expenditure or loss of revenue which were under discussion by the improvement clubs during one winter season in a Middle Western city: Crosstown lines; lower steps; six tick-

ets for a quarter; new fenders; double tracking; no-seat-no-fare; express service; bridge tolls; no-stop cars; paving; heating of cars.

The above, if put into effect, would involve an expense of a million dollars or more. If any deduction is to be derived from the experience of this Middle Western city, it is the wondrous ability of an improvement club in starting an agitation which became more or less effective. In the case of the Middle Western city the crosstown line was finally agreed to by the local public utility. The lower steps agitation was mothered by the Women's Club and won in a jump. The six-tickets-for-a-quarter scheme was defeated in the courts, new fenders were ordered, the no-seat-no-fare lost out, bridge tolls were adjusted and the paving bill runs higher and higher.

It is evident that the improvement club has within it all the elements which go to make trouble for the manager of a public utility unless he can secure its co-operation. Many are the plans devised to bring about co-operation between the improvement club and the public utility. The first element to be considered is the character of service rendered the public by the utility. Cheap goods at high prices have no place in the game of publicity. Co-operation cannot be secured if the bargain is left handed with the jughandle in the grasp of the utility. Street car men are merely merchants. They have a given commodity to sell, and it is no different than the sugar of the grocer. To secure co-operation there must be good service rendered. With this fundamental to begin with the opportunity for publicity of an appreciable character is an inviting one.

There should be a close contact on the part of the utility with each club, particularly its officers. There should be a complete list of all the members, their house addresses, their occupation. A neighborhood club too often takes into account only its immediate section without relation to the hundred or more neighborhoods throughout the system, and it is this broader relation that should be impressed upon the members. To any one who has much to do with the improvement club it is apparent that there are difficulties in the way of convincing those who have the political bee in their bonnets and have a sinister purpose to accomplish at the expense of the utility. With these persons the contest takes on the character of a battle of wits, and not unfrequently the man with "a sinister purpose" is defeated.

The Psychological Time to Cut Service

In explaining the present dull business of the country President Wilson, in talking to the representatives of the National Vehicle and Implement Dealers' Association, remarked that the "trust" legislation proposed no doubt was having a depressing effect, but he regarded the present era as "psychological" for the correction of evils which later on, if permitted to run, would even create more suffering. The President's term "psychological" as applying to the present situation finds a counterpart in the utility field. What the President no doubt means is that an early day cure involves a milder dose of medicine to take than permitting the fever to run its course. While the President's viewpoint as to trust legislation does not meet with the writer's approval, his method of reasoning—taking the trouble by the nape of the neck—has much in it that can be commended. There is an incident now in process of incubation with an Eastern utility which is being watched to find the "psychological moment" for action. The situation is something like this: The company found its gross earnings falling off as a result of lessened travel upon the street cars. The apparent need of reducing the service was manifested, and the order went out to "cut." There is no feature of the relation between the public utility and the community which is so delicately attuned and so responsive to public displeasure as the street car service. Take out any cars on a given line, and within a very short time there will be a delegation in the railway president's office entering serious objections. In the case in question the lines were tightened by making faster time, and here and there was an actual reduction of the service. The first manifestation of displeasure came from the men who were let out. They told their neighbors. A week or more rolled round, then came a brief notice in the newspaper. Another week there was a letter written to the newspapers by a patron complaining of the service. The next step will be the call of a reporter. Later on the improvement club will take up the issue. Then perhaps there will be a complaint filed before the public utility commission, and an investigation will follow.

If the situation is not handled with care the ire of the public will be taken out in some form of drastic legislation. The point to be attained is to discover the precise moment for action to avoid the usual holocaust. In other words, when will the "psychological" moment appear? Shall the old service be put on for a week or more only to return later on to the cutting process and thus jockey along until the public has forgotten the incident? The interesting feature of the experiment now being undertaken is to note each step made by the public. Apparently only a very small portion is aware of the cutting down. This is due to the skill with which the schedule man is handling the car line, and it may be that the skill of the schedule man will save the day. It must be conceded that the least said about the changes the better. To announce a reduction in the service in the public press and thus to commit the proposition to the "direct" method of publicity would only produce the storm to be avoided. The situation of this Eastern utility is not an unusual one, although it has features out of the ordinary: a heavy fixed charge, a large track mileage and long lines. The public views with complacency the fixed charge and feels that the service should be adequate. Its conception of an adequate service is not in accord with the heavy fixed charges, and the outcome is being watched. What will be the next move? And when will be the "pyschological" moment to bring a peaceful solution of the difficulty?

If advice is to be given it would be to go slow with the changes and the cutting down process. If it is to be admitted that the "indirect" method is a better one, then the process should be very slow. There should be co-operation between the club and the management. Ordinarily the citizen will realize the full force and effect of dull times and for that reason may admit of a slight cut. However, each move will prove an interesting chapter in the book of "Cutting Down the Service."

Suggestions as to What to Do

An experience of years with the improvement clubs has brought these conclusions to the writer:

Keep in close touch with all of them. Upon the very first appearance of trouble meet the members more than half way. Let them be free to come to the office. Treat them as a very vital element in the business of the day. Make apparent the difficulties of operation, and let no stone go unturned which will bring about the co-operation so heartily desired. The improvement club is one of the most vital factors in the utility field to-day.

Changes in Taxation Laws

Abstract of Report of Committee on Taxation at A. E. R. A. Convention, Showing Modifications in State Tax Laws—Franchise Tax Burden on User—Gross Earnings Tax Truest Measure of Property Value

The committee on taxation confined its efforts this year to an endeavor to keep abreast of the changes in the taxation laws of the various states. Thirty-five states reported no change. From four states no report was received, namely, Arizona, South Dakota, Tennessee and Wisconsin. Iowa reported the passage of a joint resolution calling for an amendment to the constitution to be submitted to vote not before 1916. It provides for the classification of property and the exclusive taxation of property so classified for state purposes. Maryland created a tax commission. Massachusetts changed its method of taxation of foreign corporations and provided for the levying of an income tax. Minnesota passed a bill classifying property for purposes of taxation. The Oregon tax commission changed its method of valuation, which resulted in an increase in taxation.

From the tables prepared by the bureau of the census, the percentage of gross earnings paid in taxes by electric railways in the various states has been computed for the years 1902, 1907 and 1912 as shown in the table on page 926.

Special Taxation

At a meeting of the National Tax Association, the committee on taxation of public service corporations submitted a report in which is discussed the question of "the equalization of taxation upon public service corporations subject to ad valorem taxation." Attention should be called particularly to this expression of the committee:

"A generation ago, before states and the nation had undertaken to regulate effectively, through commissions or otherwise, the service and charges of public service corporations, this theory [i.e., special taxation much heavier than that imposed on other classes of business or property because they hold special franchises of great value] offered a natural and logical remedy for some of the evils of unregulated monopoly.

"But the situation changes when public service corporations are brought under effective regulation. Under the latter condition, regulation of rates and service must proceed upon the theory that the corporations should be allowed to earn a reasonable return upon a fair valuation of their property. Special taxes upon regulated monopolies, therefore, merely increase the expense of providing the service and increase the rates necessary to allow a reasonable return, or else diminish the resources available for extending and improving this service.

"It is through public regulation and not through taxation that a correct policy toward public service corporations must be worked out, and theories of taxation should be based on the assumption that public service corporations are to be subjected to public control."

In the special report on taxation, of the bureau of corporations of the federal government, issued December, 1913, the federal government notes the change in the method of taxation of public utilities in Rhode Island by the creation of a permanent tax commission and the imposition of a tax of 1 per cent on the gross earnings from operation of street railways within the state in addition to the tax of the same amount heretofore levied by the state as well as to the general property tax on the tangible property of the companies. The new tax is in lieu of other taxes on intangible personal property and exempts holders of stocks, bonds and other evidences of indebtedness of such companies from taxation.

The conference of New England state tax officers held in January and December, 1912, adopted a series of resolutions recommending to their several states the classification of personal property for purposes of taxation, an extension of franchise taxes at rates which shall compensate for advantages enjoyed, and, in connection therewith, the exemption from local taxation of those securities whose value is included in the value of the franchise.

The state of Connecticut appointed a commission of three disinterested persons "to examine into the system of the taxation of railroads and street railroads located partly or wholly within the state . . . and to make such recommendations in connection therewith as shall seem to them advisable." The commission appointed by the state of New Jersey recommended, among other things, that public utility properties now locally assessed should be assessed by a state board of equalization with the aid of data from the public utilities board and valuations certified to local taxing districts. A special commission in Colorado recommends that all public utilities be taxed by a central taxing body.

Tax on Franchises

In a paper on the taxation of public service corporations, Milo R. Maltbie, Public Service Commissioner for the First District of New York, before the second international conference on state and local taxation, said:

"The method of taxing public service corporations which has attracted the most attention within the last few years is the special franchise tax. It is virtually a tax upon the right to use the streets, highways and public places for special purposes. The primary object of the movement for the taxation of franchises has been not so much to increase governmental income as to secure to the public a larger share of the profits of the corporations. Whether investors in public utilities have obtained a larger profit than they have deserved may be an open question, but that the public generally believes that they have is indisputable.

". . . But wherever there is a complete and effective system of public regulation or wherever it may be obtained as easily as the franchise tax, the advisability of attempting to control corporations thereby is open to question. The amounts taken from the public service corporations through a franchise tax may be collected in the long run from the users of the service and not from the stockholders. Under an effective system of public regulation the corporation must, of course, be allowed to earn a sufficient amount to pay all costs of operation and also a fair profit on the capital used. If, in addition, a sum must be earned to pay a franchise tax, the authority exercising public control must allow the corporation to place its rates sufficiently high or to supply service so inferior that it may earn the tax.

"The franchise tax imposes a burden on the user in order that property owners in general may be relieved. If every citizen used the services of the public utilities in direct proportion to his ability to pay, or the property he owns, or any other just standard, the injury would be merely theoretical. But the use of public utilities, especially in cities, usually bears little relation to indi-

vidual income or property owned. Consequently, every dollar that is taken from public service corporations for the support of the government is likely to be taken from those who are least able to pay."

Gross Earnings Tax

The report of the commission on revenue and taxation of the state of California in 1906 contains the following:

"The true present value of a street car property depends solely upon what can be taken out in gross yield less operating expenses and depreciation. The only item ascertainable with any degree of certainty is the gross receipts. The gross earnings tax is, therefore, suggested by the very fact that any other sort of taxation is uncertain and indeterminate in application and operation and must directly or indirectly refer back to the earnings. It has, moreover, all its usual advantages of certainty and ease of administration, of steady yield and steady growth, of satisfaction to the public and to the companies. It is notable that whenever cities lease or rent franchises for a term of years, they almost universally prefer a percentage of the gross earnings as the annual rental charge to a fixed annual payment. The reasons which incline both parties to regard this as the fairest and most satisfactory form of bargain apply with full force to the question of taxation."

At the sixth national conference, Alfred H. Holcomb, assistant secretary American Telephone & Telegraph Company, said:

"The increasing exemption from taxation of certain forms of personal property, such as moneys and credits, relieves private owners of such property from a burden in a way which is never thought of for public service corporations and which is even impossible of application to them under the special methods which have been devised for the assessment of their property. The 'stock and bond' method, for instance, or the 'net earnings' method reach a value for the entire property, real, personal and mixed."

It seems to be the general consensus of opinion of the closest students of the question of the taxation of corporations, and more particularly of public service corporations, that the gross receipts method is the fairest and truest measure of the value of the property which can be obtained, far superior to the ad-valorem method.

Difficulty of Valuation

The difficulty of adequately or fairly valuing the property of a public utility is illustrated by the opinion of Chairman Stevens, Public Service Commission for the Second District of New York, in the Westchester Street Railway case decided April 24, 1912. This opinion is in part as follows:

"An inquiry into the value of a railway property as a whole is an investigation of the question, how much money or other things will men be willing to part with for the sake of possessing such property? The difficulty attending the investigation is: (1) the property has never been, we will assume, bought or sold, so that there is no direct test or evidence of its ratio of exchange; (2) it is not one of a class of things which is bought or sold with such frequency or under such circumstances as to afford a fair test of what it would be likely to bring upon exchange or sale.

"In short, no direct evidence is obtainable concerning its probable ratio of exchange. The only course open to the investigator is to select those qualities or attributes which in his judgment would create a desire for the property and then estimate how much that desire would induce a prospective purchaser to surrender for its satisfaction. The value of a property depends upon its earning power, direct or indirect. To the ordinary investor it is its direct earning power as shown by the excess of its revenues over its expenses. To another road it may be indirect, by furnishing business upon which a profit can be made, or by the suppression of destructive competition. The net earnings rule of valuation, when properly and carefully applied with due regard to all the features of the individual case, is probably the one having the surest support of basic principle."

It has long been apparent to public utilities that their property was not being assessed by the same method as was the property of individuals or mercantile and manufacturing corporations, whether these assessments were made by local assessors or by commissions created for the purpose. This impression is confirmed and some of the reasons therefor well set forth in the second annual report of the Tax Commission of Ohio, which reads to this effect:

"To properly perform his duties under these circumstances requires a degree of moral courage in the assessing officer which is not possessed by the average human, and his returns are more usually works of fiction than of truth. Proper returns have never been and never will be secured until property is assessed by officers whose tenure of office and compensation are made to depend on efficiency and faithful observance of the law."

Commenting on the provisions of the Ohio law which require all property to be assessed at its true value in money, the commission remarks:

"It will be necessary to make some radical changes in the statute before proper results can be secured. Property should be valued as the commercial world values the same. . . . That property of public utilities has not been assessed at the commercial value the slightest investigation will demonstrate. The capital stock and bonded indebtedness of the public service corporations in Ohio, as reported by the commissioner of internal revenue for the year ending June 30, 1911, amounted to $1,690,000,000, with net earnings of $53,118,252, or a little more than 3 per cent on the total capitalization. This commission assessed the property of the corporations in Ohio for the year 1911 at $912,000,000, or a sum nearly equal to the net earnings as stated in that report, capitalized at 6 per cent.

"The capital stock and bonded indebtedness of the industrial, mercantile, manufacturing and miscellaneous corporations in this state, as reported by the commission of internal revenue for the year ending June 30, 1911, exceeds $1,750,000,000, with net earnings of $151,504,400. The property of all the incorporated companies in Cincinnati, not only manufacturing, but mercantile and all other kinds, exclusive of public service corporations and banks, was assessed in 1910 at $17,697,260, or at a little more than 10 per cent of the amount of capital invested by manufacturing corporations alone, as reported by the Bureau of the Census. As the conditions were relatively the same throughout the state, it is certain that the total assessment of all the private corporations in Ohio for the year 1910 would not exceed $150,000,000. These figures were very largely increased during the last year, but it is believed property of this kind is not yet assessed at near its true value."

In support of its contention, the commission later on quotes from the Minnesota Tax Commission:

"The uniform universal custom throughout the entire state has been to assess property at from 25 to 50 per cent of its actual value, and this custom has had the long-continued approval of the people, the silent support of the law-making and the law-enforcing departments of the state government. It is a stillborn statute,

unenforced and unenforcible. Any attempt to comply with its provisions would be revolutionary."

CONCLUSION

It is, therefore, perfectly apparent that under present-day conditions, with a full knowledge of the value and capitalization of properties in the hands of the taxing authorities and with none of this information with respect to other properties in the hands of the authorities, and with the voting power of the individual property holder held as a club over the taxing bodies, particularly the local assessor, the electric railway industry, together with other public utilities, is bearing an undue and unfair proportion of the burdens of taxation.

TABLE SHOWING BY STATES PER CENT RATIO OF TAXES TO GROSS INCOME FOR OPERATING AND LESSOR COMPANIES COMBINED

	1912	1907	1902
United States	5.6	4.6	4.8
New England:			
Maine	3.3	1.9	1.9
New Hampshire	3.2	1.5	1.3
Vermont	3.1	2.1	1.8
Massachusetts	7.8	5.8	6.3
Rhode Island and Connecticut	6.6	5.5	5.3
Middle Atlantic:			
New York	5.8	3.9	5.2
New Jersey	5.9	4.1	4.4
Pennsylvania	3.4	2.1	3.9
East North Central:			
Ohio	5.7	4.0	3.4
Indiana	3.0	3.7	4.9
Illinois	8.7	4.6	5.2
Michigan	4.3	3.5	3.5
Wisconsin	5.8	4.9	3.8
West North Central:			
Minnesota	6.3	5.9	3.5
Iowa	2.8	2.3	2.3
Missouri	5.9	6.1	6.0
North and South Dakotas	3.1	1.8	...
Nebraska	7.3	5.1	2.5
Kansas	5.0	2.3	2.3
South Atlantic:			
Delaware, Maryland and District of Columbia	6.7	6.2	6.9
Virginia	5.3	4.4	2.8
West Virginia	4.4	3.6	2.5
North Carolina	2.5	3.0	2.5
South Carolina	2.7	3.2	3.2
Georgia	6.0	6.2	4.6
Florida	5.0	3.6	2.3
East South Central:			
Kentucky	6.1	6.5	6.1
Tennessee	6.8	6.9	6.1
Alabama	6.4	5.1	2.5
Mississippi	3.7	3.5	1.7
West South Central:			
Arkansas	4.8	2.4	1.9
Louisiana	5.8	6.0	6.9
Oklahoma	4.3	1.3	...
Texas	3.8	3.0	2.3
Mountain:			
Montana	4.2	2.5	2.8
Colorado	5.7	3.3	3.5
All other mountain	3.9	...	...
Pacific:			
Washington	6.3	4.6	3.1
Oregon	7.1	3.2	1.7
California	4.2	4.2	5.0

Discussion on Reactance by A. I. E. E.

At the meeting of the American Institute of Electrical Engineers held in New York on Oct. 9 the topic for discussion was reactance in power station and transmission work. This topic is of particular interest to electric railway men at this time on account of the attention devoted to it in the Atlantic City report of the committee on power generation of the American Electric Railway Engineering Association. Two papers were delivered in New York, "Protective Reactances for Feeder Circuits of Large City Power Systems," by James Lyman, L. L. Perry and A. M. Rossman, all of Sargent & Lundy, Chicago; and "Use of Reactance with Synchronous Converters," by J. L. McK. Yardley, Westinghouse Electric & Manufacturing Company.

The first paper continues the discussion of the effects of reactance in power stations covered by the same authors in a paper printed at the 1913 midwinter convention of the institute. The present paper discusses in greater detail the uses and limitations of reactance coils in the feeder circuit of large city power stations. They conclude that in a large city power system, the miles of underground cable and consequently the cable faults increase at a faster rate than the generating capacity. The severity of short-circuits also increases with increased generating capacity. Feeder reactances are particularly effective in reducing and localizing the effect of such short-circuits. When properly proportioned feeder reactances are used, an increase or decrease of generator reactance has only a limited effect on the amount of kilovolt-amperes flowing into a fault. Bus-section reactances in the generating station in connection with feeder reactances still further reduce and localize these effects, even when it might be more desirable to distribute their effect if other conditions permitted.

It would be desirable for many reasons to operate feeders in parallel at their substation ends, but such operation tends to increase greatly the kilovolt-amperes flowing into a feeder short-circuit and to cause other feeders besides the one affected to trip out when overload relays with the usual settings are used.

In his paper Mr. Yardley presented a large amount of original data on the effects of protective reactance on the a.c. side and d.c. side of the rotary converter. Many oscillograms of currents and emfs were reproduced in connection with the paper. He divided synchronous converter installations into several classes for purposes of analysis, namely: those in which it is of prime importance to keep voltage on the lines, those in which heavy overloads are frequent but where the voltage may be allowed to drop off during overload, and those in which brief although frequent interruptions are not objectionable if necessary to protect apparatus. On account of space limitations it is impossible here to even summarize the results of the tests described by Mr. Yardley which have been very recently carried out. Among other conclusions he states that if a properly-designed quick-acting circuit breaker be used, and the proper amount of reactance be placed in the d.c. circuit, it is impossible to flash a converter over, as the circuit-breaker will trip out the circuit before the current approaches the tripping-out flash-over value.

In the discussion D. B. Rushmore, Schenectady, N. Y., called attention to the present-day recognition of the necessity for considering an electrical system as a whole rather than treating each part separately. Formerly the demand was for transformers of low reactance, while now special effort is made to make it as high as possible. Phillip Torchio, New York, claimed that insulated rather than bare wire should be used in reactance. H. W. Buck, New York, stated that long-distance transmission lines possess inherently so much reactance and resistance that protective reactors are not needed so far as the delivery of the line is concerned. J. J. Frank, Pittsfield, Mass., expressed the opinion that, since it has no moving parts, the reactor is the most satisfactory and reliable protective device thus far developed. N. W. Storer, Pittsburgh, said that the protective reactor should be equipped with a quick-opening short-circuiting device to connect the reactor in circuit when the reactance is needed and to keep it short-circuited at all other times.

In line with the country-wide movement to grasp opportunities offered by the Panama Canal and the war in Europe for the expansion of United States trade in South America, J. G. White, of J. G. White & Company, Inc., New York, has established three scholarships in the Spanish language at the Pennsylvania State College. He offered the prizes "as a stimulus to the students to fit themselves for handling Latin-American trade." Mr. White's offer has been accepted.

New Presidents of the Associations

Those Elected Were: Accountants' Association—C. S. Mitchell, Pittsburg Railways; Claims Association, William Tichenor, Terre Haute, Indianapolis & Eastern Traction Company; Engineering Association—L. P. Crecelius, Cleveland Railway; Manufacturers' Association—E. H. Baker, Galena Signal Oil Company; Transportation & Traffic Association—M. C. Brush, Boston Elevated Railway

At the concluding sessions of the four affiliated organizations of the American Electric Railway Association the elections of the new presidents for the ensuing year resulted in the selection of men who have all been active in association work, and who may be expected to maintain the high standard of past activities in cooperating with C. Loomis Allen, the new president of the American Association, of whom a biography was published in yesterday's issue. Brief biographical sketches of these new officers as well as of the newly elected president of the Manufacturers' Association are given in the following paragraphs.

Matthew C. Brush, who was elected president of the Transportation & Traffic Association on Thursday, is second vice-president of the Boston Elevated Railway. He graduated from Armour Institute in 1897 and from the Massachusetts Institute of Technology in 1901, and soon after graduation took up work in the mechanical and transportation departments of the Union Pacific, and Chicago, Burlington & Quincy Railroad. While in steam railroad work he acted as machinist, foreman, and roundhouse foreman of the Union Pacific Railroad with headquarters at Omaha, Neb., and he was general foreman in charge of shops and roundhouses of the Chicago, Rock Island & Pacific Railroad. He also secured some experience in steamship traffic in the Great Lakes district.

In 1904 he entered electric railway work as general manager of the Boston Suburban Electric Companies, which operate an extensive system of suburban electric railway lines west of Boston with headquarters at Newton. Soon after he was also elected vice-president of the system. Here he carried forward a constructive policy of strengthening public relations, systematizing operation and placing the entire system upon a firm financial foundation.

In the spring of 1910 Mr. Brush accepted the position of general manager of the properties controlled by the Buffalo & Lake Erie Traction Company, with headquarters in Buffalo, but returned to New England in November of the same year to become assistant to the vice-president of the Boston Elevated Railway. He was elected to his position as vice-president of the Boston Elevated Railway Company early in 1912.

In all of the positions which he has occupied Mr. Brush has made constant efforts to promote friendly relations with employees and with the public. He is credited with the first successful attempt to secure six-cent fares on a large scale on a New England system. In his present position he has had charge of the efficiency work of the company and has waged a warfare against preventable losses, and on behalf of service improvements. He has taken an active interest in railway association work, notably the New England Street Railway Club and the American Electric Railway Association. Since Mr. Hegarty's resignation he has been acting president of the Transportation & Traffic Association, and showed by his conduct of the sessions of this association at Atlantic City that he has those qualities which will enable him to administer the duties of his new office in a most efficient manner.

L. P. Crecelius, who was elected president of the Engineering Association on Friday, was born in St. Louis, Mo., in 1879, and received his educational training in the public schools of that city and in the St. Louis Manual Training School of Washington University. After completing this course he began an apprenticeship in power plant work with the Southern Electric Railway Company as plant electrician in 1899. When this company was later consolidated with other electric railway properties into the United Railways he continued in the power department of the new company in various capacities. In 1896 he left St. Louis to go to Newark, N. J., to accept the position of assistant superintendent of overhead construction of the Public Service Railway under Albert Stanley. He gave up this position in 1907 to go to Cleveland, Ohio, where, after

M. C. BRUSH
President Transportation & Traffic Association

L. P. CRECELIUS
President Engineering Association

the readjustment of traction affairs in that city, he was engaged to assist in appraisal work. In 1910 he was appointed by John J. Stanley to be superintendent of motive power and electrical engineer of the Cleveland Railway. He continues in this work at the present time and has had a great deal of interesting work in connection with the rehabilitation of the power distribution and substation equipment of the company.

Mr. Crecelius is an active member of the American Electric Railway Engineering Association and of the American Institute of Electrical Engineers. In the former he has naturally specialized in the direction of power generation, having been chairman of the power generation committee in 1912 after membership in the committee for two years. He began his active work in the association on the car wiring committee about 1907. During the past few years he has been especially interested in the development of the 60-cycle converter and presented a paper on this subject recently before the Cleveland Section of the American Institute of Electrical Engineers. He contributed an article on the same general subject to the 1914 report of the committee on power generation of the Engineering Association. Mr. Crecelius has an inventive turn of mind and an inspiring enthusiasm for his work. As vice-president of the association he has become familiar with its administrative problems.

C. S. Mitchell, who was elected president of the American Electric Railway Accountants' Association at Atlantic City on Oct. 15, has been third vice-president of the association during the past year. He has long been active in the association, has been a member of different committees for a number of years and has been a member of the association since 1900. Mr.

C. S. MITCHELL,
President Accountants' Association

WILLIAM TICHENOR,
President Claims Association

Mitchell's railway experience has been entirely in Pittsburgh. He was born near that city and entered the auditing department of the United Traction Company of Pittsburgh in August, 1897. In 1899 control of the road was purchased by the Philadelphia Company which in 1902 acquired all of the surface railways in Pittsburgh. At that time Mr. Mitchell was appointed auditor of the combined property and continued in that position until 1912, when he became controller of the company.

William Tichenor, the new president of the American Electric Railway Claims Association was born in Lewis, Ind., in 1859. After completing his education in a country school, he taught school for ten years. During this period he married, and in 1891 moved with his family to Ann Arbor, Mich., where he studied law in the University of Michigan. He graduated in 1893 and soon after completing his law studies, moved to Terre Haute, Ind., where he began the practice of law. In 1896 he was elected prosecuting attorney of Vigo County, served two years in this capacity, and then returned to the practice of law in Terre Haute.

In January, 1905, Mr. Tichenor was made assistant attorney of the Indianapolis Traction & Terminal Company. Later when Hugh J. McGowan, then president of that company, purchased and merged the lines which now form the Terre Haute, Indianapolis & Eastern Traction Company, he was made claim agent of the company and he holds this position at at the present time. He became a member of the Claims Association at the Columbus convention in 1906 and has attended every convention since that time. During the past two years he has served as second vice-president and first vice-president, respectively, of the association.

E. H. BAKER,
President Manufacturers' Association

Edwin H. Baker, the newly elected president of the American Electric Railway Manufacturers' Association, has a widespread acquaintance and rich experience in association and railway affairs which eminently fit him for the position to which he has been elected. Mr. Baker was born in Brooklyn, N. Y., March 4, 1853. He attended school in his home city and graduated from the Brooklyn Polytechnic Institute. His first business position was with S. T. Baker & Company, with whom he remained from 1873 to 1894. Then he entered the service of the Galena Oil Company, now the Galena Signal Oil Company, of which he is second vice-president.

Mr. Baker was elected a member of the executive committee of the Manufacturers' Association in July, 1905. He served as chairman of the finance committee in 1904-1905, as treasurer in 1906, and for three years has been vice-president in charge of exhibits. He is a member of the following clubs: Brooklyn, New York Railroad, New York Yacht, New England Street Railway, Empire, Boston Railroad and Pittsburgh Railroad.

First Lecture in Correspondence Course

The first lecture in the correspondence course for electric railway accountants conducted by John R. Wildman, professor of accounting New York University, School of Commerce, Accounts and Finance, is to be mailed on Oct. 19. The lecture discusses first the purpose and scope of accounting, this subject after the general introductory remarks being taken up from the standpoint of the purpose of the systems of accounts established by public service commissions. Professor Wildman then mentions the factors that produce income, namely, land, labor, capital and business organization. In connection with the latter point, valuable information is offered concerning the economic phases of organization. Later an extended discussion of the legal phases of business organization is given, showing the proprietary or capital accounts that are used under each form and the legal method of organization, rights and liabilities that characterize each form. Trusts, including consolidations, mergers and holding companies, will be discussed more in detail when the preparation of financial statements is studied. The lecture contains at the end references for collateral reading and the first quiz for the members of the course. The latter consists of an essay regarding various features of the corporate and financial organization of the correspondent's company.

It is stated that the names and marks of the ten men submitting the best quiz papers will be published in the lecture next month.

A recent issue of the *Electrical Review*, London, gives the total value of British export trade in electrical goods in August as £238,621, compared with £564,291 in July. The principal markets for the August electrical exports were: Canada and Newfoundland, £14,960; Argentina, £37,269; India, £40,215; Victoria, £13,778; New South Wales, £14,155, and New Zealand and Fiji Islands, £11,309. The United States, Philippines and Cuba received £1,476 from Great Britain during August, and Germany received £5,768. The principal item of export was machinery which had a value of £86,789 or, roughly, 37 per cent of the total. The registered electrical imports into Great Britain amounted to £86,734, having fallen from £291,244 in July. The principal countries supplying this trade were the United States, £39,426, and Germany, £24,953. The corresponding German figure in July was £168,000. The principal item of import was machinery. It was valued at £29,152 or, roughly, 34 per cent of the total. During the month the British re-exports amounted to £10,001.

South American Trade Opportunities

Several speakers discussed South American trade opportunities at a lunch of the Merchants' Association of New York, held at the Hotel Astor on Oct. 14. Those who spoke were W. S. Kies, manager foreign trade department National City Bank of New York; John F. Fowler, vice-president W. R. Grace & Company, New York, and Charles M. Pepper, former foreign trade adviser of the Department of State. Nearly 1000 people attended the lunch.

Mr. Kies explained in detail the plans of the National City Bank for the opening of two branch banks in South America. The decision to open these branches, which was reached in June, before the commencement of the European war, was made possible by the new federal reserve law. It was mainly through the assistance of German and British banks in South America that the trade of Germany and Great Britain with South American consumers had been built up to large proportions. It was well understood that a regular provision in the loan arrangements between those banks and South American borrowers required that the proceeds be spent with manufacturers in the countries which advanced the funds. When the new banking act was passed many inquiries as to the possibilities of foreign business were received. As a result of these, 6000 letters were sent by the bank to exporters and importers, and the responses showed that American manufacturing interests had suffered from lack of banking facilities in South America. Within a few years the development of trade with South America would lead to surprising and satisfactory results.

Mr. Fowler said that there was no mystery about South American commerce, but that it required care and meant large and long responsibilities. Long before the European war was started there was a general business distress in South American countries. Each South American country would have to learn, one by one and each in its own way, how to face the present problem and how to get on its feet again. The buying power of South America, Mr. Fowler added, was much crippled and would remain so for some time. It must not be imagined that all exports from Europe to South America were cut off. Up to the time of the present economic distress in South America trade between this country and South American countries had been increasing. Mr. Fowler expressed the belief that hereafter this country would enjoy a larger share of the commerce of South America. As a market South America had not been neglected by this country. There was not a small town in South America that was not ransacked for orders on behalf of merchants and manufacturers in the United States.

It could not be expected that this country, under the conditions that had prevailed in the past, would take as large a share of South American trade as would Europe with its population of 450,000,000 comprising both producers and consumers. That population was to be compared with the 100,000,000 of this country, most of whom were pretty well contented with what they got at home. The new tariff law, however, was a sign that this country was prepared to buy more from the rest of the world than it had done before. Hereafter this country would increase steadily the volume of its purchases from South American countries.

The present was an opportune time, Mr. Fowler said, but the prospects must be considered earnestly and sensibly, not hysterically. A great deal of what had been preached lacked common sense. It always had been European capital that stimulated South American countries. If capital from this country could be sent to the assistance of South American countries, it would help greatly to develop future trade. Referring to the frequent reproaches against exporters here on the score of niggardly credits, Mr. Grace said that our exporters had been very liberal and much more so than they would be in home trade. Whether he bought in Europe or here, the worthy South American trader had about the same credit facilities. Wherever situated, it was the unworthy customer who howled the loudest when merchants would not give him dangerous terms. Shipping facilities, Mr. Fowler declared, were relatively as good to South America as to Europe, and there was no complaint to be made about freight rates.

In conclusion, Mr. Fowler mentioned some "don'ts," which briefly were as follows: Don't use second-hand packages. Don't use boxes carrying old ship marks. Don't advertise contents on the outside of packages. Don't forget that freight is frequently discharged on rough seas. Don't forget that the customer wants to receive goods on time. Don't forget to give good service with reasonable charges.

Mr. Pepper declared that South America was one of the great and growing markets of the world and should be studied in that attitude. He advised manufacturers to establish permanent exhibits of products in large South American centers. This country was reaching the period when a great many more manufacturers must have foreign markets.

Lessons from the South American Experience

Col. Herrera de Hora, in giving to a representative of the Electric Railway Journal the story of his thirty-odd years' experience in South America, stated that in 1880 he began electrical pioneer work there with the Bell telephone and the Brush electric light. This succeeded well, and if the industry had been judiciously fostered by extending a fair amount of credit, so as to enable the people to digest the new industry, America would have been pre-eminent in the electrical enterprise. Our manufacturers, however, says M. de Hora, saw fit to insist in almost all instances on practically cash transactions with the result that the Englishman entered the market. Having banks, such as the London River Plate, the London & Brazilian, the British Bank of South America and several others, through which they had been in the habit of extending credit for Manchester goods from six months to periods of eighteen months and two years, they attacked the electrical market on the same credit lines, so that the American orders rapidly fell off and by 1890 most of the trade was in English hands. The Germans then came along, and by means of hard-working and courteous representatives who spoke the language, by means of metric catalogs in Spanish and Portuguese, and by means of manufacturing to order, they succeeded in ousting the British. At the outbreak of the present European war Germany practically controlled the electrical supplies of the whole South American continent, although their goods are inferior in most cases to the British and more so to the articles supplied by American manufacturers.

If our manufacturers wish to succeed in South America they can only do so by taking a leaf out of the Germans' book. They must endeavor to satisfy in every sense their customers, by sending an experienced and tactful representative speaking fluently the languages of the countries he visits, to study conditions, ascertain the status of the business people, make friends and social acquaintances and, most important, find out the exact requirements of the various purchasers. Then they must fill those requirements without one hint of substitution and with especial care in packing. Amer-

ican manufacturers must not forget that South America is full of shrewd business men, honest and reliable. They are naturally proud of the progress made by their various countries and they can be reached only by gaining and holding their entire confidence.

COMMUNICATIONS

Using the Technical Journal

STONE & WEBSTER

BOSTON, MASS., Oct. 6, 1914.

To the Editors:

I note with interest in the issue of Oct. 3 an abstract of Mr. Alvord's paper on "How to Use a Technical Journal," and I could wish he might follow it with a second paper, pointing to the solution of several problems, questions that must almost of necessity confront every engineer, whether he be classed as "young," "middle-aged" or "mature." Mr. Alvord says that he, himself, maintains a file of clippings and abstracts, a practice which, I believe, has proved very satisfactory to most engineers who have adopted it. I would be surprised, however, to learn that he does not let any questions go unanswered —or answered by mere guess—because he has not a clipping on the subject and does not know where he may readily find the needed reference. Therefore, I would plead for a better way of rendering available a great deal that is valuable, but effectually lost, because apparently too insignificant to index, or because it appears as part of an article under a different title.

I have long urged that the library world should so organize as to provide a custodian for every idea and every article needed by men in business or professions. It is easy enough to lay out such an organization on paper, but not easy to get people to believe in it, much less to finance it. The mere system of indexing is not a matter of greatest difficulty, but it is difficult to decide how far to go, i. e., to decide what is merely waste and what needs to be particularly cared for. A librarian not having use for an article himself, may trust too much to the titles and names of writers, while often the technical man scorns what is not of use to-day.

I believe, however, that we are evolving toward a system in which the specialists are to be held morally responsible for information and sources of information kindred to their specialties. For instance, in the needed system, if two engineers are particularly interested in good roads, one would hold himself responsible for the literature of tar macadam roads, and the other for that of wood pavements, assuming that the whole literature of roads and pavements is too much for one man. This would be a step toward contributing to the support of a special library on roads, which would naturally know who are the specialists. This same idea carried to its ultimate development is what we need the country over, professional men of every description standing sponsors for, or subscribing to the work of, those who will collect the information and have it available when wanted.

I would hold publishers of journals responsible to maintain card indexes of substantially everything that goes into their journals, so that they can hold up their right hands and say, "Nothing has appeared in this journal in the last ten years of more than six lines in length that we cannot lay our hands upon."

Such refinement is, I believe, a matter of the near future, because men in their earning capacity are realizing more and more that they need to know what other men have said that pertains to their immediate problems. Believe that the well-trained librarian can generally advise about the ways and means of getting information on almost everything, and insist that he thus make himself useful to you. He may tell you that John Smith has a still better clipping file than yours, and you may need to thank the librarian for putting you in touch with your superior. G. W. LEE, Librarian.

Insert Special Work Failures

THE MEMPHIS STREET RAILWAY COMPANY

MEMPHIS, TENN., Oct. 7, 1914.

To the Editors:

I have read with interest the very exhaustive articles on "Insert Special Work Failures," in Nos. 12 and 13, Vol. 44, of the ELECTRIC RAILWAY JOURNAL. I thoroughly concur in all you have to say and wish especially to emphasize what you have said in regard to the proper installation of special work. It is difficult to instill into a foreman the exact care necessary to get the best results. I believe that the life of a complicated layout of special work can be increased fully 50 per cent by proper installation and maintenance.

I also wish to call attention to one feature of insert failures not mentioned in your articles; namely, the carelessness on the part of the manufacturer in forming the groove through the insert plate. Failure to have the groove of the insert uniform with the groove of the adjoining rail, especially in curves, is the cause of the gouging of the opposite rail. This is a defect difficult for the railway company to remedy and one to which the manufacturers should give careful attention.

J. H. HAYLOW, Engineer.

UNITED RAILWAYS COMPANY OF ST. LOUIS

ST. LOUIS, MO., Oct. 9, 1914.

To the Editors:

In my opinion the article entitled "A Study of Insert Special Work Failures," appearing in the ELECTRIC RAILWAY JOURNAL of Sept. 19, and the article entitled "Examples of Insert Special Work Failures" appearing in the issue of Sept. 26, cover the subjects very thoroughly. Such articles as these are sure to result in a more thorough study of special work failures by maintenance of way departments. In addition to the study of special work pieces in service, a thorough study of the scrap pile and of the worn-out special work pieces at the time they are removed from the track is worth while.

There is no doubt that the life of insert special work could be materially increased if inserts were tightened, readjusted or removed at the proper time, or if proper work was done with the rail grinder or welder to reduce the pounding of car wheels at cupped places. It has been the practice of this company and, I believe, of almost all of the large companies, to keep one or more gangs constantly engaged in making repairs to insert special work. There is a large variation in the amount of work to be done, however, and it is not always possible to obtain at the proper time a sufficient number of men who are competent to make such repairs. If the work is not handled by well-trained men a large number of inserts are almost sure to become loose in a short time, and even with the best men it is difficult to obtain satisfactory results with some of the types of so-called renewable inserts.

C. L. HAWKINS, Chief Engineer.

The Public Service Commission for the First District of New York has issued Vol. 8 of its proceedings for the period from Jan. 1, 1913, to Dec. 31, 1913. A very complete index at the back of the volume permits a quick reference to any of the cases before the commission during the period.

Equipment and Its Maintenance

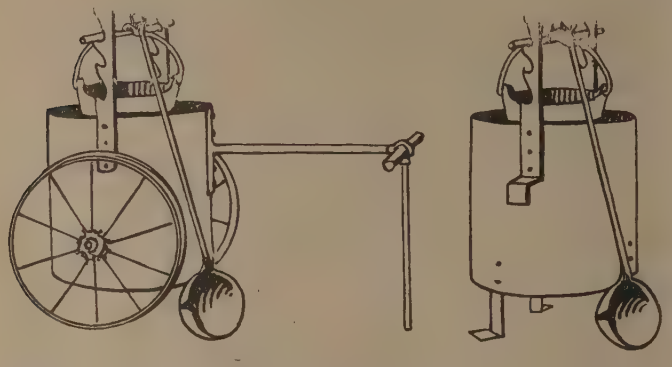
Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Centers—Renewal and Repair

BY R. P. WILLIAMS, INSPECTOR OF SPECIAL WORK BROOKLYN RAPID TRANSIT SYSTEM

"Get acquainted with your fastenings" is the first word in the care of centers. The maker is always ready to explain their construction. There are many styles of fastenings, and a clear understanding of them will be a big first help. Watchfulness is the next. Examine your centers after a rainstorm, or after the sprinkler has been around; wet lines remaining around the edges of the center show the fastening to be imperfect. If the



FURNACE POT AND LADLE OF PORTABLE AND STATIONARY TYPES

style of the fastening will permit, tighten it as soon as possible; this will often prevent the loosening of the crossing arms.

TOOLS

Owing to the variety of fastenings, a full list of tools cannot be given. However, the use and make of the levers and special tools required will be explained and often furnished by the makers of the special work. The chipping tools shown are indispensable. Two styles of lead furnaces are also illustrated; the one on wheels is the better. Before lighting your fire, take the weight off the wheels. To do this we use three short pieces of rail which are 1 in. longer than the distance from the bottom of the furnace to the bottom of the wheels. If the weight is not taken off, the tops of the wheels will soon begin to bind against the side of the furnace. A good grinder is a necessity; flexible shaft types are the most practicable. A good blow torch, also, is needed.

SAFETY FIRST

When chipping, always use goggles with a good heavy glass. "The eye you buy is never as good as the one nature gave you." Always set a block about 6 in. high and 1 ft. wide, with a generous quantity of waste between the block and your chisel; this will protect the pedestrian and incidentally the near-by store windows.

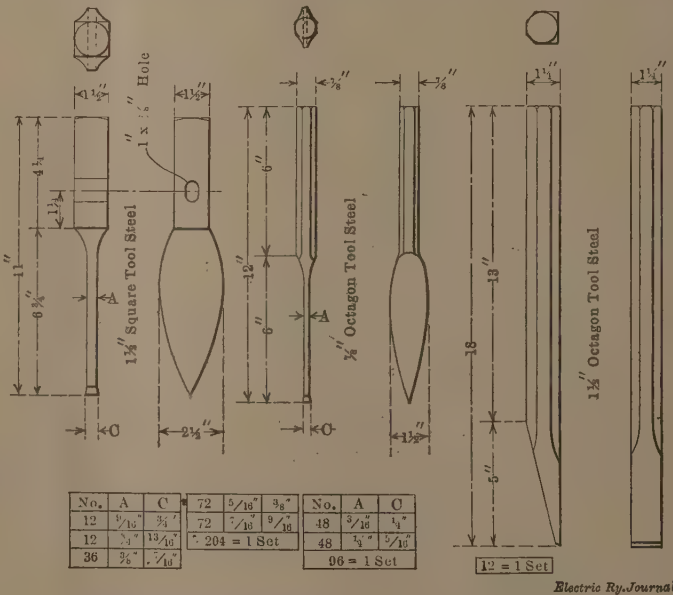
REMOVING THE CENTER

The method of removing the center depends upon the style of fastening. If there is babbitt to remove, you may be able to confine your chipping to one side. Thus clear, you may be able to force your center over to one side, which will give more room to work on the other and allow the use of the heavier cutter. "Stickers" are often met, and the best means we have found to remove them is by expansion. The torch is applied until the entire casting is heated; next a ring of clay or putty about 1 in. high is placed around the center; cold water is then poured on the center, a spillway having been formed to carry the water outside the casting. As soon as the center shows cool, a vigorous attack with light sledges will loosen up the worst "sticker." The operator will quickly become expert at this work, and much time and labor will be saved. The center removed, a thorough cleaning out of all dirt is necessary. To reset for babbitting, all moisture must be removed. The torch is seldom used for this, as kerosene and waste are better and cheaper.

RESETTING

The resetting of the center is the important point and requires quite a little skill. Four points are selected close to the ends of the abutting rails. Then the distance from the top of the rail to the bottom of the bed is found. From this distance deduct the thickness of the center, and the remainder will be the height of the bearing point. Finally, the center is lowered to the tops of the bearing and adjusted until there is a perfect bearing at all four points. It is essential that there shall be no rocking when the fastening is applied.

Opinions differ as to the material for use in the bearing points. We have obtained the best results, under traffic, with soft iron. Some use lead while others use copper. We have found babbitt very good, especially with bolted centers, because the strain can be gradually increased, while lightly tapping the bearing points, until the center is brought to the proper level. The next thing of importance is a good tight end fit. No dependence should be placed on the babbitt for keeping the center tight. A good hard babbitt should be used in order to prevent sagging or giving way in the center.



Electric Ry. Journal

STANDARD CHIPPING TOOLS FOR HARD CENTERS

Babbitt should not be subjected to excessive heat. The practical test of the required heat is made with a piece of dry paper or a sliver of white pine; when the paper or pine flames, your metal is right and should be used quickly for best results.

Pouring babbitt is dangerous work if the proper precautions are not used. A little kerosene in the bottom of the bed will often save a bad burn and can never do any harm. Always use goggles and cover up the top of the hands.

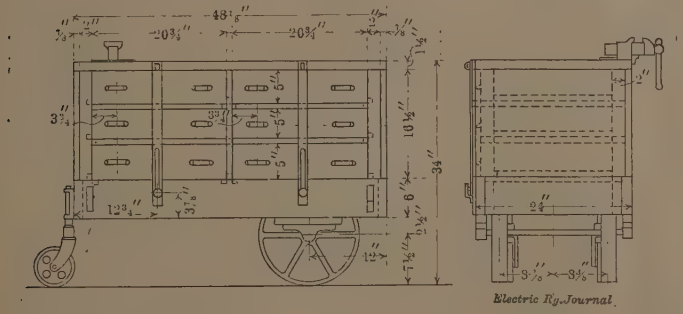
A good emergency repair on an all-babbitt center is made by placing some screen wires or ⅛-in. or 3/16-in. rods in the bottom of the opening, raising them above the floor on small bits of iron, say, ¾ in. high; place a hammer handle in the groove and pour the opening full of babbitt. The wire prevents the metal from being pounded up to one end, and you will be astonished at the service secured from a center like this. We have had them under fairly hard service for three months and they remained in good shape. They will at least save your crossing while waiting for the new center.

The question of comparative merit between the all-babbitted center, the center with a partly machined bearing surface and the center with a completely machined bearing surface has been raised. No center made will last as long as the crossing (and by this the 90-deg. or nearly 90-deg. crossing is meant) without unduly dishing or becoming so noisy as to make its renewal or repair necessary, but the all-babbitted center, properly installed, will hold just as well as either of the other types. The manner of fastening will not prevent cold rolling or peening; this must be overcome either by direct downward pressure or greater depth of center. This can be done just as easily with the all-babbitt center, with the advantage in its favor of quick renewal and easy fitting.

Detroit United Portable Work Bench

BY C. L. KELLER, ASSISTANT MASTER MECHANIC DETROIT UNITED RAILWAY

The removal from cars and storage and replacement of the many small brass castings and other parts, prior to painting and finishing, is a process that generally entails numerous petty but annoying losses. Even the loss of time occasioned by the overturn of a box of



DETAILS OF DETROIT UNITED PORTABLE WORK BENCH

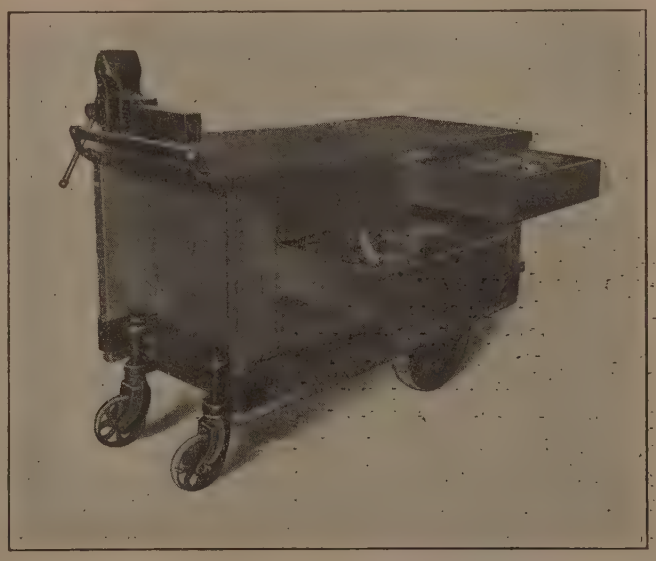
wood screws or the misplacement of a casting or the running back and forth to a work box may amount to an appreciable period. Therefore, any device that permits work of this character to be accomplished with the least loss of time is always of interest.

At the Highland Park paint shops of the Detroit United Railway, a portable work bench that deserves comment is in use. This bench is mounted on the familiar type of shop truck and consists of a cabinet 24 in. x 48 in. in plan, containing six drawers. The top of the cabinet is made of 1½-in. oak, and is fitted with a cast-iron woodworkers' vice and a suitable handle for pushing the bench from car to car. The drawers may be locked by means of slotted bars and padlocks, as will be best understood by reference to the accompanying illustrations.

When a workman receives orders to strip a car, he places all the necessary tools in one of the drawers of the bench, and pushes the bench to a convenient location alongside of the car. The several fittings, upon removal, are placed in a drawer reserved for that purpose. When

PORTABLE WORK BENCH WITH DRAWERS LOCKED

the work is completed, the bench is returned to the stripper's storeroom, where the parts are made into bundles or placed in boxes and tagged with the number of the car. It has been found in practice that two men can work with ease at one bench, and that a number of cars may be stripped before the drawers are filled.



PORTABLE WORK BENCH WITH DRAWERS OPEN

Hence only a few trips to the stripper's storeroom are necessary.

The method of bundling and boxing the fittings eliminates the confusion and chance of loss in the stripper's storeroom, and greatly expedites the cleaning and polishing of these parts. Even the wood screws removed when taking down the trimmings are kept in small boxes provided for that purpose and are used again. When a car is ready for trimming, the drawers of the bench are filled with all the parts belonging to that car, in addition to a supply of extra nails, brads and screws for emergency use. Thus the bench has made it possible to com-

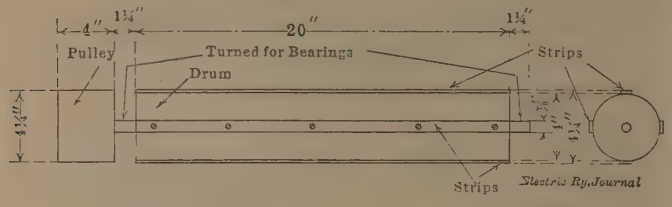
plete the trimming of a car without requiring the frequent trips between car and storeroom formerly necessary. The approximate cost of one portable bench complete is about $40, which is more than made up by the saving of time.

Device for Testing Controller Finger Springs

BY R. H. PARSONS, ELECTRICAL FOREMAN

The Third Avenue Railway, New York, has recently put into use a simple device for testing the springs of controller fingers. This addition was brought about by trouble with broken springs and the fact that certain manufacturers submitted samples of fingers, the springs of which are claimed to be practically unbreakable. To get to the bottom of the situation and to see if there was anything in the claims for unbreakability a device has been fitted up as follows:

A K-11 controller frame then in the shop for over-



DRUM USED IN CONNECTION WITH A K-11 CONTROLLER FOR TESTING FINGER STRIPS

hauling was stripped with the exception of the main cylinder bearings and the fingerboard. An old car axle was mustered into service by turning it to 4 in. in diameter for its full length and also turning it down to ⅞ in. at two points, as shown on the sketch. These points correspond with the bearings of the controller frame, as the turned-up car axle was to fit into the place of the main controller cylinder. The end shown at the left of the sketch was to act as a pulley.

Four strips ⅓ in. thick x 1 in. wide were screwed onto the drum over its entire length and were equally spaced on its surface. The drum was then fitted into the frame, and the bearings were replaced. In this way we obtained a false cylinder. Next the fingerboard was equipped with the fingers to be tested. These fingers were applied in the usual manner with the regular holding screws, and all were set with the same spring tension. The completed frame was then fastened to a bench, and a belt regulated to run at a speed of 320 r.p.m. was attached to the pulley from the shop line shafting.

The fingers under test are set with 8-lb. spring tension, adjusted so that normally they rest lightly on the drum. As the drum turns, the strips raise the fingers ⅛ in. allowing them to drop to the drum after passing the strip and again lifting when the next strip is reached, thus getting four lifts per revolution of the drum, the action being exactly the same as that received in regular service in a controller.

The diameter of the drum over the strips is the same as that of a main controller cylinder measured over the plates. Therefore the fingers are raised at the same angle as in a real controller, and the lift due to the strips is practically the same as that recommended by the manufacturers of the fingers.

Although not necessary, the standard controller cover is put onto the frame to help keep out the dust and to drown the noise. The drum is well greased with vaseline and is allowed to run continuously. As stated before, the drum makes 320 r.p.m. and as the fingers get four lifts per revolution the fingers will move up 768,000 times during a ten-hour day. It seems to me that this test will decide a number of points about controller fingers.

Proper Connections of Transformer Secondaries to a Self-Starting Rotary

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, ONT.

The following incident may be of educational value to the substation construction man:

A substation was erected to house three 500-kw rotary converters with three 185-kw, 25,000-volt, sixty-cycle, single-phase transformers for each rotary. The transformer primaries were connected in delta and the secondaries in six-phase, 428 volts with 61 and 91 per cent starting taps. The rotaries were six-phase, self-starting on the a.c. side, diametrically connected and wound for 600-volt, d.c. railway service.

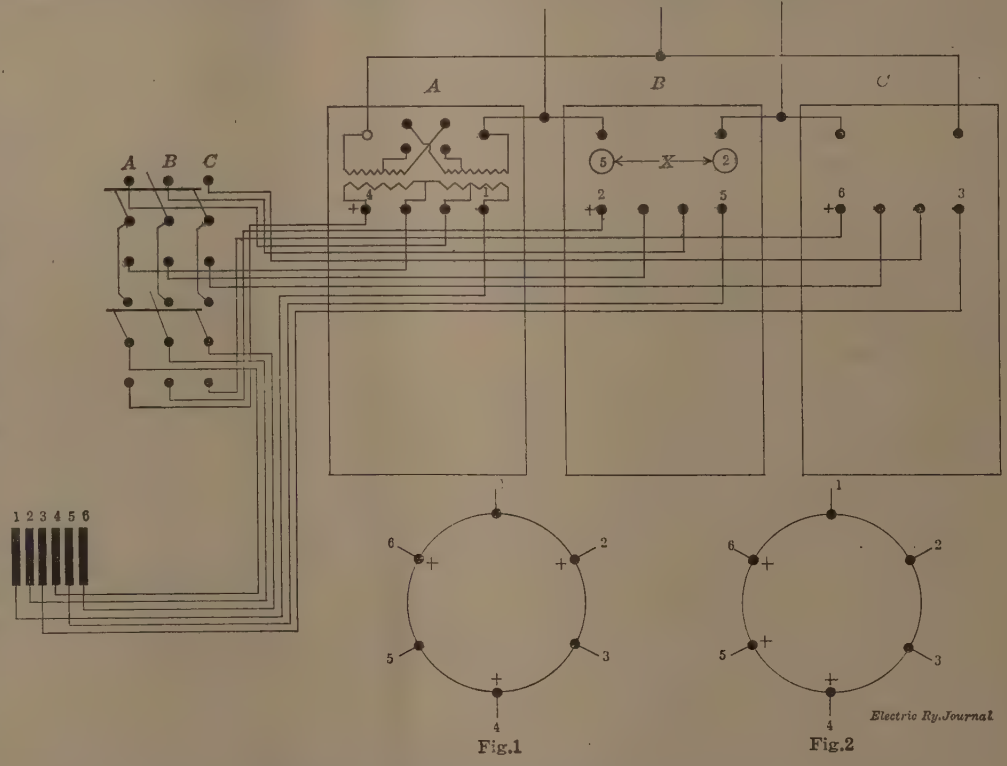


DIAGRAM OF CONNECTIONS BETWEEN TRANSFORMER SECONDARIES AND CONVERTER RINGS WITH ANALYSES SHOWING CORRECT (FIG. 1) AND INCORRECT (FIG. 2) ORDER OF CONNECTIONS

When the rotaries were lined up and the transformer primaries connected I asked the engineer in charge if he had any blueprints of the secondary connections. He answered "No," but gave me half a day to work out the connections from the manufacturer's instruction book. (It should be stated here that the a.c. start-

ing panels and the d.c. panels were supplied by another manufacturer so that we had no assembly print of the connections.) Within the time stated I presented to the engineer the accompanying diagram, which he in turn submitted to the rotary manufacturer's representative for verification before ordering the connection of the secondary cables. But the representative condemned the diagram and ordered us to change the two leads on transformer *B*, indicated by *X* in the accompanying drawing, so that the lead going to ring No. 2 would be transposed to ring No. 5, while the No. 5 lead would go to ring No. 2. The rest of the diagram was pronounced all right.

The cables were connected and on the Sunday afternoon set for starting the machinery we tried the rotaries, but they would not run at all although 60 amp at 25,000 volts were being taken from the line. On examination we found that two armature coils of each group of coils were cold but that the third coil was red hot.

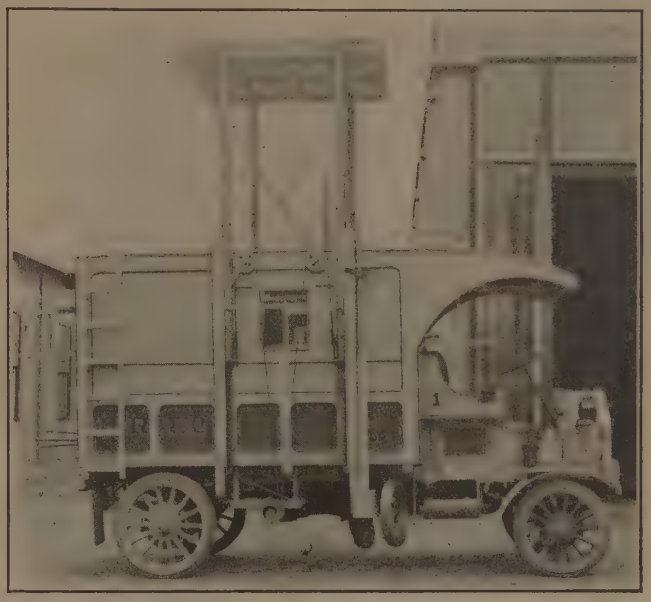
We had a long debate as to the cause of the trouble. Some suggested an auxiliary induction motor for starting and others proposed to change the armature. After three days we determined to "cut and try" until the right way was found. Strange to say, when the two leads on transformer *B* were reversed to comply with the original diagram the rotary converter ran correctly. On analyzing the connections we found that the order of positive and negative connections was in alternation as per Fig. 1, whereas the connections suggested by the manufacturer's representatives came out as per the impracticable negative and positive grouping shown in Fig. 2.

When the substation was placed in service the manufacturer's representative was promoted by his company to the position of district engineer. I was dismissed.

Motor Truck for Line Maintenance

A motor truck for overhead line maintenance embodying a number of unusual features has recently been purchased by the line department of the Harrisburg (Pa.) Railways. Essentially this truck consists of the standard chassis sold by the Motor Truck & Tractor Company, Harrisburg, Pa., equipped with 40-hp, four-cylinder Continental engine and fitted with a body designed especially for overhead line maintenance. This body, exclusive of the driver's seat, is 10 ft. long x 5½ ft. wide over all. The interior of the body, which is reached from the ground by two steps at the rear, is fitted with a work bench, tool box, combination ladder, racks for rope and wire and shelves for miscellaneous tools and buckets. An extension of the upper rear step permits the installation of the pipe vice. A small cabinet on the opposite side of the steps provides space for the soldering kit. This cabinet is substantially built and lined with sheet asbestos so that there will be no liability of fire in case the solder kit is set in it while hot.

Perhaps the most novel feature is that the tower platform, which is 6 ft. x 5¼ ft. in size, is raised and lowered by the engine which drives the truck. By means of a worm drive in combination with a friction drive



MOTOR TRUCK OF HARRISBURG RAILWAYS WITH MOTOR-DRIVEN TOWER PLATFORM RAISED

connected to the engine shaft, the tower elevating mechanism is driven by the truck motor. The friction drive is engaged with the engine shaft by a hand lever accessible on the platform floor. This lever is connected to the friction drive by an extension shaft, hence it is operative at any position of the platform. The upper section of this shaft is a rectangular bar which fits into a pipe with a nut bushing at its upper end.

HARRISBURG RAILWAY'S LINE TRUCK WITH POLE TRUCK ATTACHED

The tower elevating shaft projects each side of the car body, where it is fitted with a cable drum. Over these drums two cables pass to a pair of sheaves mounted near the top of the body, and each cable connects to a leg of the tower. The platform legs and guides are of wood and steel construction, being of sufficient length to raise the platform 17 ft. above the ground, thus permitting a lineman to work on a trolley with 22 ft. clear-

ance above the top rail. The platform has folding hand rails on all four sides. A short ladder at one end of the body permits access to the roof, and a small rail around the edges of the roof makes it possible to use this space to store pike poles and other long linemen's tools.

In addition to providing an engine which will propel this truck at approximately 15 m.p.h., the engine was made large enough to draw a pole truck, a coupling being provided for this purpose at the rear end of the body. Views of this truck with the tower in the elevated position, and with the tower down and the pole truck coupled for transportation, are shown in the illustrations.

Inexpensive Shield for Welding Service

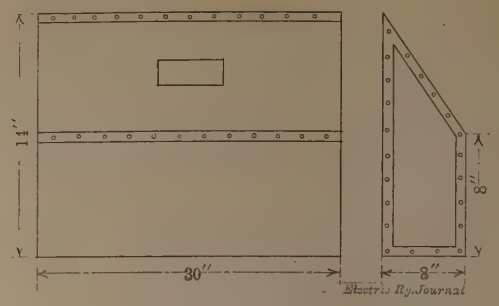
To protect the eyes of passers-by when electric welding operations are in progress, the Cumberland County Power & Light Company, operating the electric railway system of Portland, Maine, places around the point the shield illustrated in the accompanying halftone.

The shield is made of car dasher steel 1/16 in. thick and is 30 in. long and 18 in. square at each end. A ⅜-in. round rod brace connects the ends near their outside edges. The force working on the welding job is provided with special goggles, but as a cheap but effective "safety first" device in the interests of the public the shield deserves mention.

WELDING SHIELD USED AT PORTLAND, MAINE

Car Cleaners' Refuse Pan

In order to reduce the cost of car cleaning to a minimum, and at the same time eliminate floor trash which may represent a fire hazard, the master mechanic of the Little Rock (Ark.) Railway & Electric Company has devised and is using a refuse pan of the type shown in the accompanying illustration. This box is made of No. 16 or No. 18-gage galvanized iron, the opening near the top of the apron serving as a handle. The pan was made in the company's shop and its width is governed by the width of the standard step, since it is usually set beside the lower step where the refuse may be swept into it. When the pan is filled it is dumped into a larger trash container located at some convenient point on the carhouse floor.



SHEET METAL BOX

Emergency Kits at Junction Points

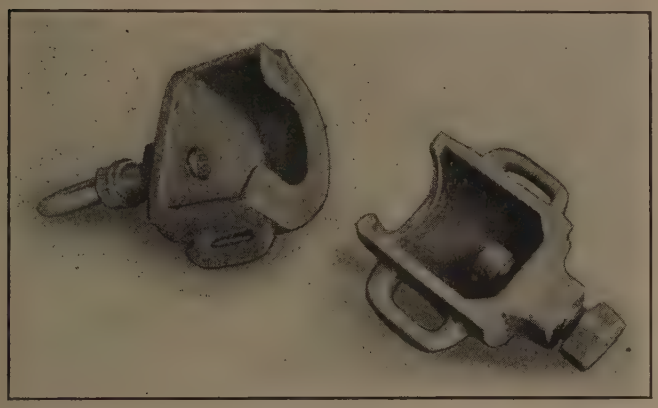
At a great number of junction points on the Minneapolis and St. Paul street railway systems of the Twin City Rapid Transit Company emergency outfits similar to that shown in the accompanying halftone are maintained. These outfits are housed in a wooden box located under the railway's telephone call box. The emergency supplies include trolley pickups, extra switchrods, shovel, broom and such personal belongings like raincoats, rubber gloves, etc., as may be stored there by the local inspectors. A 1-in. steel cable with swivel hooks at each end is stored around the pole holding the box. This cable is available for use in case of derailment or in handling broken wagons.

EMERGENCY TOOL BOX AT JUNCTION POINT

The buses of the Coventry, England, tramways department have been requisitioned by the government for military purposes, and are to be sent to Aldershot.

East St. Louis Pinion Pullers

Generally speaking there are almost as many different kinds of motor pinion pullers as there are shops in this country. Those employed by the East St. Louis & Suburban Railway, while in some respects like others already described, include several features. The pinion pullers shown in the accompanying illustration are used to remove GE-73 twenty-four tooth pinions and GE-70 seventeen-tooth pinions. The castings were made by a local foundry from patterns furnished by the railway. The work of finishing and applying the pulling screws was done in the railway's shops.



PINION PULLERS OF THE EAST ST. LOUIS & SUBURBAN RAILWAY

The smaller puller, or that for the GE-70 seventeen-tooth pinions, is made with a large nut on one end of the puller screw, and the other end is enlarged and cupped so that it will fit over the end of the armature shaft. The other puller also has the cupped puller-screw bearing, but the projection of the screw beyond the nut is formed into an eye. This eye serves as a place to attach the hook from the overhead traveling hoist, which is used to elevate armatures from the pit to the shop floor. A pinion puller of one of these types is provided for each of the different types of motors used by this company. The finished GE-73 puller cost approximately $9, and the GE-70 puller cost about $7 complete.

Testing Dielectric Strength of Oil

To insure successful operation of high-voltage oil-insulated apparatus, it is necessary to maintain the dielectric strength of the oil at maximum value. A testing set has recently been developed and placed on the market by the General Electric Company for determining this quality.

This set consists of a testing transformer with an induction regulator for voltage control and an oil spark-gap. All of the parts are assembled and mounted to form a compact unit which may be conveniently and quickly operated. The set is built for both twenty-five and sixty cycles.

The transformer has a rating of 3 kva at 30,000 volts, but may be operated at 10 per cent above this figure. The high voltage winding has a voltmeter coil for indicating directly the test voltage. The transformer tank is of drawn seamless steel and the cover is fitted so as to be oil-tight, permitting shipment filled with oil. The induction regulator allows a variation of the test voltage from zero to maximum. The regulator, as well as the transformer, is arranged for series-parallel connection, making the set suitable for use on 100-volt or 200-volt circuits. A dial is attached to the top of the rotor shaft of the regulator and is accurately graduated to give readings of the test voltage directly in kilovolts. The set may also be equipped with a small portable voltmeter for reading the test voltage, provision being made on all outfits for mounting an instrument specially designed for the set. This instrument is of the dynamometer type, is very accurate and the scale is graduated to read the test voltage in kilovolts.

The oil is tested between flat metal disks, which are located inside the receptacle. One electrode is stationary, and the other has a micrometer adjustment with an adjustable zero index. This permits taking up readily any wear in the gap. The receptacle is designed so that it may be very conveniently cleaned. It is estimated that ¾ qt. of oil is sufficient for one sample, allowing five tests on clean oil.

The oil receptacle and spark-gap are supported by the high-voltage terminals of the transformer. Merely by turning the receptacle about its horizontal axis, the oil which has been tested may be emptied, being caught by a depression in the transformer cover and flowing away through a pipe. The receptacle and gap may also be easily removed from the supports, leaving the transformer free for high potential testing of any kind up to 33,000 volts. This apparatus is also equipped with a small sensitive circuit-breaker of novel design, which is attached to the side of the regulator. The set may also be mounted on a truck, making it portable.

TYPE K 30,000-VOLT OIL-TESTING SET

The use of the induction regulator for voltage control produces no noticeable distortion of the emf wave shape and therefore contributes greatly to the accuracy of the test results. The weight of the sixty-cycle set complete is 465 lb., height 30 in., length 24 in., width 17½ in.; the weight of the twenty-five-cycle set complete is 670 lb., height 32 in., length 26½ in., width 20½ in.

An agreement has been reached between the St. Louis, Springfield & Peoria Railway, included in the Illinois Traction System, and the Southern Illinois Light & Power Company whereby the railway agrees to carry freight for the light company in smaller quantities than carload lots. The agreement has been approved by the State Public Utilities Commission of Illinois.

News of Electric Railways

TRANSPORTATION CONDITIONS IN PITTSBURGH

President Callery of Pittsburgh Railways Reviews Transportation Problems in Letter to Mayor

J. D. Callery, president of the Pittsburgh (Pa.) Railways, recently sent to Mayor Joseph G. Armstrong a reply to the Mayor's communication in regard to conditions in Pittsburgh. In his letter Mr. Callery refers to the Mayor's expression of a hope that the company and the city will be able to come to some amicable agreement. He says he reciprocates that feeling, as the company prefers to give good service and to "establish relations of peace and comfort between the city, the company and the latter's patrons." Mr. Callery first replies to the Mayor's apparent implication that the company has not done all it could possibly do to provide good service, then analyzes the Mayor's suggestions, saying some are practicable and others are not, and declares that the service is as good as could be expected "in view of the little aid the company received from the two preceding administrations." Not much can be accomplished, Mr. Callery says, "unless the whole people will give us their intelligent co-operation." The Mayor's recommendations will be carried out, Mr. Callery promises, or else he will show the Mayor that it is not wise that they should be adopted. Concerning the company's treatment of recommendations made by the State Railroad Commission several years ago, the letter makes these assertions:

That on the thirteen routes for which additional service during the rush hours was recommended the service is 44 per cent better; that there are 38 per cent more street inspectors to regulate the headway of cars that the schedule may be followed; that there are no more switches in the downtown district that have to be operated by the crew of a car; that the heating and ventilation of cars are better regulated and are in charge of the crews; that the company has shown itself ready to co-operate in the abolition of grade crossings; that 308 double-truck cars have been put into service instead of only the fifty additional fixty-six-seat cars recommended by the commission in June, 1910; that in trying to improve the service and to change the number of cars to suit the requirements of travel the company is at a disadvantage in that there are some lines which do not have places at the termini where cars can be turned, and therefore a few lines do not furnish as good a service as they otherwise could; that many of the twenty-eight-seat cars have been abandoned, as recommended, and replaced by larger cars.

Several reasons against through routing of cars are given. Regarding the suggestions by the Mayor for a more liberal transfer system, Mr. Callery says:

"A universal transfer system in such a city as Pittsburgh would not be just to the company. You do not suggest such a system in your letter, nor do I believe that you would think of demanding it. There must be some proportion established between the distance the passenger travels and the 5-cent fare. Every patron will recognize that there is some mileage which he is entitled to for 5 cents, and he ought not to ask for more, nor would he if he thought he was justly treated. We are limited to a fixed fare of 5 cents within the city, and every passenger coming into town in the morning or going home at night gets an equivalent for what he pays. Short riders do not proportionately get as much as the passenger who is carried 4, 5 or 6 miles, but we do not like this any better than the short rider does. It is impossible in street-car traffic to make each passenger pay exactly the mileage he travels, as in railroad traffic. It would take too much time to adjust it on the cars. The London bus system could not be applied to street cars.

"Every district of the county has its own through service into the city. This is due largely to the topography. Street cars have to follow the easiest route. There are sixty-six distinct lines that touch the downtown district. We cannot construct and operate crosstown routes with any advantage. It has been our aim and purpose to bring every passenger into the heart of the city for one fare. We have tried to select transfer points so that men and women may get to and from working centers for one fare.

"It is not to the particular advantage of the people of the city to give universal transfers, but rather to the suburban patrons who get a long ride anyway. To give to a patron of one distinct route a transfer which would let him ride to the end of the other sixty-five routes would be folly. There is no way by which we can get money to run the cars except through the 5 cents from our patrons. A general transfer system would give to those persons who may now get a long ride a still longer one, and the person who really pays his own fare and a little more for the suburbanite would have poorer service.

"I have felt it my duty to state my objections to some of your suggestions, but I wish you to understand from this letter that I am ready to do anything that is practicable in the way of adopting any of the changes and recommendations of yourself and of the City Council. There is no one who is more anxious than I to have the Pittsburgh Railways give the best possible service to the public."

A list of suggestions for new franchises is appended to Mr. Callery's letter, the proposed grants including curves, turnouts, sidings and new tracks on streets already occupied by rails and on streets not yet occupied.

DEVELOPMENTS IN CLEVELAND

New Stock Issue, Schedules and Safety Zone Matters Reviewed

The Cleveland (Ohio) Railway has applied to the Ohio Public Utilites Commission for permission to issue $2,382,600 of new stock. Councilman William Stolte and others objected at once on the ground that the low fare would be endangered by the additional stock issues. Mayor Baker, however, notified the company that the city would make no opposition. He said that the place to oppose expenditures is in the City Council and not before the commission. E. W. Doty, a member of the commission, said that a hearing on the application would be held shortly. Joseph Alexander, engineer, of the street railway commissioner's office, said that all the expenditures shown in the application were favored by Commissoner Witt.

Councilman Koch introduced a resolution at the regular meeting of Council on the evening of Oct. 5 which provides for a 4-cent fare with a rebate of 1 cent for transfers. Mayor Baker, however, disapproved of the plan. Mr. Koch insists that it is unfair to force those who are compelled to use transfers to make up the deficits in operation. W. F. Thompson, president of the City Council, revived the idea of the zone system. He says that it is practically impossible to extend the 3-cent fare system to outlying territory and that a readjustment of the plan must be made at no distant date.

J. J. Stanley, president of the Cleveland Railway, stated that the company would insist upon the schedules in the Tayler franchise, and that it would be unwise to try to undo what has been done and introduce another period of trials and uncertainty.

Cleveland is experimenting with a safety zone system similar to that in use in Detroit. At two Superior Avenue crossings and at the car stop on the east side of the Public Square zones have been marked off with paint on the pavements, and police officers have been stationed to instruct both pedestrians and drivers of vehicles how to use them. Safety lanes 25 ft. wide have been marked from curb to curb at the crossings and a strip 60 ft. long and 6 ft. wide has also been marked off at each car stop. This space is known as the safety strip. No vehicle is allowed to drive inside of this strip.

W. R. Hopkins, president of the Cleveland Rapid Transit Company, announced on Oct. 5 that all arrangements had been completed to finance the underground railway which the company proposes to build in Cleveland. The time for commencing the work will depend upon the breaking of the financial deadlock caused by the European war.

Members of the Cleveland local of the Amalgamated Association of Street & Electric Railway Employees are endeavoring to have a legislative committee established by the appointment of one member from each local organization in

the State. They feel that the Legislature should collect the laws pertaining to the electric railway men and include them all in one bill, so that they would have no trouble in understanding just what is required.

NEW YORK SUBWAY CONSTRUCTION CONTRACTS

Recent Work Under Way and Contracts Let

Work has begun on the construction of the two new rapid transit tunnels under the East River from downtown Manhattan to Brooklyn. The two tunnels will be built by the Flinn-O'Rourke Company, Inc., and will cost more than $12,000,000. One will be operated by the Interborough Rapid Transit Company, and will connect the Seventh Avenue subway in Manhattan with the existing subway and its extensions in Brooklyn, the tunnel leaving Manhattan at Old Slip and reaching Brooklyn at Clark Street. The other will be operated by the New York Municipal Railway Corporation as a connection between the Broadway subway in Manhattand and the Fourth Avenue subway system in Brooklyn, the tunnel leaving Manhattan at Whitehall Street and reaching Brooklyn at Montague Street. The contract time for the completion of the tunnels has been set at forty-two months.

The Public Service Commission has awarded the contract for the construction of the diagonal station and connection in Forty-second Street between the existing subway and the new Lexington Avenue subway. It went to the lowest bidder, the Rapid Transit Subway Construction Company, for $3,097,312. This is the construction company of the Interborough Rapid Transit Company, the lessee of the existing subway. This connection will pass under the old Grand Union Hotel property and diagonally across and under Forty-second Street and a portion of the New York Central property on the northwest corner of Lexington Avenue and Forty-second Street. The diagonal station will be built in front of the Grand Central Terminal in Forty-second Street. It will be one of the largest underground stations in the world, and will have connections with the Grand Central Station, the proposed extension of the Hudson & Manhattan tunnels, the existing subway, the new Lexington Avenue subway and the reconstructed Steinway tunnel. Considering its location and the number of lines which will reach it, this station will probably develop into the greatest traffic center in New York City. As the construction must be done without endangering or seriously interfering with traffic in the existing subway, the contractor is required to give a bond of $250,000 to the Interborough Company, the lessee of the subway, as well as a bond of $500,000 to the city, for the faithful performance of the work.

Bids have been opened for that part of the Park Place, William and Clark Street subway, which runs from the Seventh Avenue subway in West Broadway through Park Place, under the Post Office Building and Beekman Street to William Street. This is part of the route which will connect the new Seventh Avenue subway with the new tunnel to Brooklyn, and will be operated by the Interborough Rapid Transit Company. It will be a two-track line, with a local staion at Park Place and Church Street, having an entrance from Broadway. It will pass under the new Broadway subway as well as the existing subway in Park Row. The official figures on the bids submitted were as follows: Frederick L. Cranford, Inc., $1,571,363; Degnon Contracting Company, $1,714,200; Smith, Hauser & MacIsaac, $1,886.467; Holbrook, Cabot & Rollins Corporation, $1,967,471; Oscar Daniels Company, $1,975,732; Underpinning & Foundation Company, $2,049,098; Rapid Transit Subway Construction Company, $2,250,175.

At its meeting on Oct. 6 the Public Service Commission refused, by a vote of four to one, to adopt a resolution, offered by Commissioner J. Sergeant Cram, declaring forfeited a contract between the city and the Dock Contractor Company for the construction of that section of the Broadway subway, Manhattan, lying between Bleecker Street and Union Square.

The Public Service Commission has approved the award by the New York Municipal Railway Corporation to the Thomas Crimmins Contracting Company for $197,442 of the contract for the installation of the third-rail, etc., in the Fourth Avenue subway, Brooklyn, between the Manhattan Bridge and Eighty-sixth Street. The proposed installation involves approximately 141,300 ft. of third-rail and 126,800 ft. of track rail bonding. The company will furnish the third-rail and most of the other materials. The contractor will give a bond of $25,000, and will agree to complete the work within thirty days from the completion of the track-laying work by the city, which is being done by the Thomas Crimmins Contracting Company.

The Public Service Commisson has approved the award by the New York Municipal Railway Corporation to the Terry & Tench Company, Inc., the lowest bidders, for $321,305 of the contract for the construction of additional tracks on the Broadway elevated line in Brooklyn between Havemeyer Street and Myrtle Avenue. The company will supply the structural steel, ties and other materials to be used in the installation of the additional tracks, and the contractor will perform the work. The plans have been submitted to the commission and approved by its chief engineer.

NEW SOUTH WALES GOVERNMENT RAILWAYS AND TRAMWAYS

According to the report of the Chief Commissioner, the number of tramway lines of the New South Wales Government Railways & Tramways open on June 30 was 212. The total capital expenditure on these lines was £7,628,653. The expenditure charged to capital account during the year amounted to £929,348. The total earnings were £1,934,164, as compared to £1,754,566 during the preceding year, an increase of £179,598, or 10.23 per cent. The working expenses amounted to £1,669,033, as compared to £1,572,190 for the preceding year, an increase of £96,843, or 6.16 per cent. The percentage of expenditures to receipts decreased from 89.61 per cent to 86.29 per cent. The net surplus, after providing for working expenses and interest on capital, was £1,680, as compared to a deficit of £32,456 last year. During the year the tramway fares were increased and it is estimated that the extra revenue secured during the last three months amounted to £45,000, thus enabling the company to wipe out the deficit that had accrued to the company during the preceding year.

During the year 310,592,698 passengers were carried, as compared to 294,455,452 during the preceding year, an increase of 16,137,246. The tramway miles run increased 1,460,709 to a total of 28,415,476. During the year 138 eighty-passenger bogie motor cars and thirty-two fifty-passenger four-wheel motor cars, besides other equipment, were purchased and 516 electric cars were overhauled. The earnings per tram mile increased from 1s. 3½d. in 1913 to 1s. 4¼d. in 1914. The working expenses showed no change in percentage, so that the return per tram mile after paying working expenses increased from 1½d. to 2¼d. The total staff during the year was 42,721, of which the tramways employed 9,394.

LAST OF TRUST LEGISLATION

The House of Representatives has now adopted the conference report on the Clayton anti-trust bill, following similar action by the Senate. The enactment of the Clayton bill into law ends the adminstrative program in respect to trust legislation, at least as far as the present moment is concerned.

Representative Mann, minority leader of the House, spoke in opposition to the adoption of the report, although he was not supported by all the other Republicans on the vote. Twenty-two Republicans stood with the solid Democratic majority as in favor of the legislation, and six Progressives also voted with the Democrats. The vote was 244 for and fifty-four against.

In attacking the Clayton bill report, Representative Mann pleaded for a cessation of legislation affecting business, saying: "We have the opportunity now by wise legislation to encourage our people to build manufacturing institutions, to make America independent practically of foreign aid in commerce, and to give us an inlet into every foreign commerce with our manufactured articles. We ought to be encouraging the production in our own country of many articles for which we are now wholly dependent upon foreign lands."

Joplin Arbitrators Chosen.—James A. Cable has been selected by the employees of the Joplin & Pittsburgh Railway and John M. Kinkel by the company as members of the board of arbitration to consider the wage schedule, which will automatically become a part of the agreement signed recently. These two will select the third arbitrator. Both Mr. Cable and Mr. Kinkel are members of the Kansas Public Utilities Commission.

Transportation Hearings for Western Massachusetts.—The commisson appointed by Governor Walsh to investigate the transportation needs of the five western counties of Massachusetts will shortly begin public hearings at the Hampden County Court House, Springfield. Among the subjects to be considered is the future electric railway development of the district. A strong sentiment on behalf of additional lines exists in many of the Berkshire towns, but no satisfactory plan of financing these has come to the front since the plans of the New York, New Haven & Hartford Railroad for the development of the district had to be abandoned for the time being.

Obstructionist Measures Laid on Table in City of Toledo.—At a meeting of the committee on public offices of the City Council of Toledo, Ohio, on Oct. 7, Councilman Mulholland's resolution to have the franchise committee break off all negotiations with the Toledo Railways & Light Company and with the various civic organizations was laid on the table. The committee took the ground that such a step would be antagonistic to every one interested in the speedy settlement of the franchise question. Council met in regular session on Oct. 5, and after adjournment the franchise committee discussed the Kryzaniak resolution to employ Cornell Schreiber, former city solicitor, to aid the law department in its contest with the railway company. This matter was finally tabled indefinitely. The majority of the members felt that City Solicitor Thurstin and his assistants are able to handle the matter and that data or information secured by Mr. Schreiber during his term in office belongs to the city and should be turned over to the law department.

New York Commission Disposing of Accumulated Business.—All cases pending since before the present personnel of the Public Service Commission of the Second District of New York assumed office have now been assigned for determination, and current cases are disposed of, in addition, as rapidly as may be. During the last month fifty-nine new formal cases were filed with the commission, but as final orders were issued in sixty-six cases the pending total has been reduced from 287 to 280. This makes a total of 363 new cases filed since March 16 of this year, and a total of 473 finally disposed of, reducing the number of cases pending from 390 on March 16 to 280 on Oct. 1. The disposition of informal complaints has kept pace with those of formal character. More than 125 informal complaints have been disposed of during the last month and eighty-four new ones filed. This reduces the total of such cases pending on Sept. 1 from 375 on that date to 331 on Oct. 1. Since March 16 more than 850 informal complaints have been filed with the commission and 1087 have been disposed of, reducing the total pending before the commission from 558 on March 16 to 331 on Oct. 1.

PROGRAM OF ASSOCIATION MEETING

Kansas Gas, Water, Electric Light & Street Railway Association

The seventeenth annual convention of the Kansas Gas, Water, Electric Light & Street Railway Association will be held at the Fifth Avenue Hotel, Arkansas City, Kan., Oct. 22, 23 and 24. The program includes the following papers: "Co-operation," by H. W. McGruder, president of the Liberal Light, Ice & Power Company; "Cost of Distribution and Overhead Charges," by E. A. Wright, manager of the Manhattan Light, Ice & Power Company; "Regulation and Control of Public Utilities," by T. J. Strickler, engineer of the State Utilites Commission, Topeka; "Safety First," by A. M. Patton, assistant general manager of the Western Rail ways & Light Company, Topeka; "Rate Making," by Prof. George Shadd, Kansas University, Lawrence; "When Bonds Come Due," by H. P. Wright, president of the H. P. Wright Investment Company, Kansas City.

Financial and Corporate

Havana Electric Railway, Light & Power Company

The condensed profit and loss statement of the Havana Electric Railway, Light & Power Company, Havana, Cuba, for the year ended Dec. 31, 1913, follows:

Gross earnings	$5,417,054
Operating expenses	2,489,832
Net earnings from operation	$2,927,222
Interest on deposits, rents, etc	140,087
	$3,067,309
Fixed charges, taxes, etc	1,219,206
Surplus income for the year	$1,848,103
Acquired surplus*	856,810
Surplus Jan. 1, 1913	294,749
Total	$2,999,662
Deduct:	
Dividends paid during the year	$1,686,205
Profits transferred to sinking fund reserve	92,412
Total	$1,778,617
Profit and loss balance carried forward to 1914	$1,221,045

*Acquired surplus represents excess in dividends received on stock of the Havana Electric Railway during the year from its accrued surplus over its actual earnings for 1913.

The above statement includes the operations of the railway division of the company only from June 18, on which date the operation by the Havana Electric Railway ceased upon its legal dissolution by merger into the Havana Electric Railway, Light & Power Company. The statement of operation of the railway division for the year, including the operation by the Havana Electric Railway to June 18, 1913, is shown by the following statement:

Car earnings	$2,860,947
Miscellaneous earnings	48,286
Stage earnings	356,894
Gross earnings	$3,266,127
Operating expenses:	
Maintenance	$322,041
Transportation	931,325
General	173,606
Stage lines	284,685
Total	$1,711,657
Net earnings from operation	$1,554,470
Deduct:	
Interest	$462,744
Taxes	61,601
Total	$524,345
Net income*	$1,030,125

*Miscellaneous income, such as interest on deposits, etc., not strictly departmental not included.

At the end of 1913 the railway department was operating twenty-four lines with a maximum of 285 cars on week days and 289 on Sundays. The total number of fare passengers was 56,782,362, an increase over 1912 of 4,913,509, or 9.47 per cent. The increase in 1912 over the preceding year was 7.1 per cent. The passenger earnings of the entire system during 1913 were 9.47 per cent in excess of the earnings for 1912. The passenger car miles increased from 9,192,296 in 1912 to 10,543,739 in 1913, or 14.7 per cent. Passenger earnings per car mile decreased from 0.2822 cent to 0.2693 cent, or 4.57 per cent. The total operating expenses increased 8.84 per cent, while the total operating expenses per car mile decreased from 0.1426 cent to 0.1353 cent, or 5.12 per cent.

The total new construction for single track, exclusive of yards, for 1913 was 5.53 miles, giving a total mileage of 71.78 miles. There were 4.68 miles of trackage reconstructed in 1913. Fifty new closed motor passenger cars were constructed and equipped and nineteen passenger cars were reconstructed. All new passenger cars were equipped for single-end operation and the older cars are being gradually changed from double to single end. The stages owned by the company decreased from 168 in 1912 to 165 in 1913, and the gross receipts decreased from $390,002 to $356,894. It is stated that preparations are being made for the use of electric motor omnibuses to replace a portion of the present stage service.

The work of maintaining discipline among the employees

through the decision of a jury of two men, selected from conductors and motormen who serve for a period of four months, has been in use, it is stated, continuously since the latter part of 1907 with increasing success. During 1913 this jury examined and passed upon 10,038 cases, out of which 6094 were warned, 2159 fined, 1541 suspended, 125 discharged and 12 ordered back to practice. During the year 170 men resigned.

Accidents involving personal injury have shown a steady relative decrease during the last six years, owing to the effect of the jury system, the improved organization and the distribution of cash prizes to car men with best accident records. The car miles per accident have increased 50 per cent as compared with 1908 and the total passengers per accident 70 per cent. During the year a total of 19,134 trips were lost owing to wagon blockades. Freight traffic required 44 per cent more locomotive hours and 85 per cent more car hours. The total freight car mileage amounted to about 4.5 per cent of the passenger car miles.

Winnipeg Electric Railway

The income statement of the Winnipeg Electric Railway, Winnipeg, Man., for the year ended Dec. 31, 1913, follows:

Gross earnings	$4,078,694
Gross expenses	2,252,606
Net earnings	$1,826,088
Fixed charges	$570,583
Dividends	1,070,043
	$1,640,626
Surplus for year	$185,462
Balance Dec. 31, 1912	2,091,236
	$2,276,698
Less transfer to reserve account	$1,000,000
Less transfer to suspense account	375,000
	$1,375,000
Balance Dec. 31, 1913	$901,698

The gross receipts of the company for 1913 were $4,078,695, as compared to $3,765,384 in 1912, an increase of $313,311, or 8.32 per cent. The operating expenses for the two years were $2,252,607 and $2,004,142, an increase for 1913 of $248,459, or 12.4 per cent. The net earnings of $1,826,088 for 1913 compared with $1,761,236 for 1912, an increase of $68,852, or 6.8 per cent. The operating ratio increased from 53.23 in 1912 to 55.23 in 1913. Passengers carried in 1913 were 59,563,757 and in 1912 51,106,017, an increase of 8,457,740. Transfers increased from 11,858,213 in 1912 to 15,039,016 in 1913.

After providing for the percentage on earnings accrued to the city and the interest of bonds, the directors declared four quarterly dividends amounting to $1,070,043. This left a surplus of $185,462 to be transferred to profit and loss, making a total credit as of Dec. 31 of $2,276,698. From this $1,000,000 was transferred to the reserve account and $375,000 to the expense account, leaving $901,698 to be carried forward to profit and loss.

During the year 18.147 miles of track were laid and forty double-truck closed motor cars were constructed in the company's shops. During the period the company was granted a franchise and made contracts for new railways in the municipalities of St. Vital and Fort Garry.

GLASGOW CORPORATION TRAMWAYS

The result of the operations of the Glasgow Corporation Tramways for the year ended May 31, 1914, shows that the ordinary income amounted to £1,083,846 and the working expenses to £676,277, leaving a net revenue of £407,569. The ordinary income of the previous year was £1,011,543 and the working expenses £619,346, leaving a net revenue of £392,196. After adding interest on investments and rental of lines, and after deducting interest, sinking fund, taxes and depreciation and expenses amounting to £418,666, the net balance of £53,892 was paid over to the Common Good. The average traffic revenue per car mile increased from 10.364d. to 10.609d., or 0.245d. The working expenses, however, increased 0.281d. per car mile, mainly on account of increased wages, extra expenditures for permanent way and maintenance, fuel costs and local taxation.

The total amount of expenditure on capital account as of May 31 was £3,675,317. The amount to the credit of the depreciation and permanent way renewals fund at the beginning of the year was £2,040,282. There was added during the year £212,642 and deducted for renewals £94,186 of the account, leaving a credit balance of £2,158,738. To the original credit in the general reserve of £39,362 there was added £113 and deducted £1,405, giving a credit balance of £38,069. During the year £77,797 was expended for ordinary tramway repairs. In addition to this £85,438 was set aside to meet the cost of track renewals, calculated at the rate of £440 per mile of single track. The total cost of ordinary repairs for the power plant and sundry machinery was £7,895, and the charges against revenue to meet depreciation amounted to £32,048. The total cost of maintenance on miscellaneous equipment was £1,426 and revenue charges for depreciation £3,714. The total length of tramways now owned by the corporation, measured as single track, amounts to more than 196 miles.

Camden & Suburban Railway, Camden, N. J.—The Camden County Board of Equalization of Taxes, acting upon suggestions of the New Jersey Board of Equalization of Taxes, recently made increases aggregating $500,000 for public utility corporations in Camden. The equipment of the Camden & Suburban Railway, operated by the Public Service Corporation of New Jersey, was raised in valuation from $231,000 to $346,000, and the value of the poles and wires of the company was increased from $150,000 to $225,000. The gas equipment of the South Jersey Gas, Electric & Traction Company, also operated by the Public Service Corporation of New Jersey, was increased in valuation from $231,000 to $347,625.

Cleveland (Ohio) Railway.—The Cleveland Railway has applied to the Public Utility Commission of Ohio for authority to issue $2,382,600 of additional capital stock.

Interurban Railway & Terminal Company, Cincinnati, Ohio.—The Interurban Railway & Terminal Company, the property of which was placed in the hands of receivers recently, suffered severely from the floods last year and from fire which destroyed its Sycamore Street depot in Cincinnati and a fire which destroyed another depot. The suit by the city to force the company to carry passengers to the city limits for a 5-cent fare complicated matters still further.

Lisbon (Portugal) Electric Tramways, Ltd.—The result of operations of the Lisbon Electric Tramways, Ltd., for the year ended Dec. 31, 1913, after deducting interest and amortization due on the debentures of the Compania Carris de Ferro de Lisboa and after the payment of £25,650 for interest on and redemption of the debentures of this company and also paying office expenses and directors' fees, showed a net profit of £103,686. Added to the £1,637 brought forward from the preceding year this gives a balance of £105,323. Of this amount £35,000 was credited to the depreciation reserve and £5,000 to the exchange reserve account, there remaining an available balance of £65,323 from which the usual preference dividend amounting to £25,533 was paid. On the ordinary share capital an interim dividend of 3 per cent, amounting to £19,020, was paid in November, 1913, and a final dividend at the same rate has been recommended. The balance of £1,749 was carried forward to next year's account.

New England Investment & Security Company, Springfield, Mass.—According to a statement filed with the Massachusetts Public Service Commission by the New England Investment & Security Company for the year ended June 30, the dividends and interest received during the year amounted to $712,215; deductions, $24,173; interest on coupon notes, $445,543, and dividends $170,000, leaving a surplus for the year of $72,499. This, combined with the accumulated deficit on June 30, 1913, of $525,717 and the discount on the sale of bonds of $23,920, gives a total deficit as of June 30, 1914, of $477,138.

Northern Electric Railway, Chico, Cal.—Meetings of the bondholders and other creditors of the Northern Electric Railway were called for Oct. 13 and 14 by the trustees of the Sloss Security Company to consider a reorganization plan.

Philadelphia & Western Railway, Upper Darby, Pa.—The gross earnings of the Philadelphia & Western Railway for the year ended June 30, 1914, were $371,857, as compared

to $297,061 for the year previous. The operating expenses increased from $174,697 in 1912-1913 to $208,377 for the present fiscal year. The net earnings increased from $122,364 to $163,480; taxes from $10,459 to $11,100; other deductions from $1,023 to $1,065, and interest from $112,617 to $136,940. The surplus account increased from a deficit in 1912-1913 of $1,735 to a surplus of $14,375 for the last year. The company now operates 38.05 miles of track and owns twenty-seven cars. The capital stock authorized and outstanding is $2,000,000 of preferred and $4,000,000 of common. The authorized bonded debt is $4,000,000, of which $3,000,000 is outstanding. Of this amount, $970,000 is in the treasury of the company. A summary of the history of this company was published in the ELECTRIC RAILWAY JOURNAL of July 18, page 145.

Public Service Railway, Newark, N. J.—The $300,000 of Paterson Railway second general mortgage 5 per cent bonds due on Oct. 1, 1914, are being taken up on presentation at the office of J. S. Rippel, Newark, N. J. Holders on paying $10 per bond may have the security extended for thirty days at 5 per cent.

United Railways, St. Louis, Mo.—James D. Mortimer, president of the North-American Company, has been elected a director of the United Railways to succeed the late James Campbell. Richard McCulloch, who has been vice-president and assistant general manager of the United Railways, has been appointed general manager to succeed his father, the late Capt. Robert McCulloch. No successor has been elected to Capt. McCulloch as president.

DIVIDENDS DECLARED

Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.

Havana Electric Railway, Light & Power Company, Havana, Cuba, 3 per cent, preferred; 2½ per cent, common.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent.

Public Service Investment Company, Boston, Mass., quarterly, $1.50, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$123,058	*$64,764	$58,294	$32,837	$25,457
1 " " '13	129,052	*70,909	58,143	32,613	25,530
8 " " '14	837,571	*502,896	334,675	258,766	75,909
8 " " '13	824,768	*495,521	329,247	252,135	77,112

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Aug., '14	$91,032	*$58,960	$32,072	$28,544	$3,528
1 " " '13	99,752	*57,787	41,965	25,381	16,584
12 " " '14	1,150,490	*712,375	438,115	327,206	110,909
12 " " '13	1,167,414	*695,613	471,801	286,549	185,252

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Aug., '14	$243,564	*$156,117	$87,447	$43,607	$43,840

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Aug., '14	$1,225,277	*$720,756	$504,521	$353,468	$151,053
1 " " '13	1,157,231	*697,055	460,176	316,217	143,959
12 " " '14	14,684,923	*8,369,284	6,315,639	4,093,067	2,222,572
12 " " '13	13,811,857	*7,951,634	5,860,223	3,726,319	2,133,904

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, MAINE

1m., Aug., '14	$272,799	*$128,777	$144,022	$63,464	$80,558
1 " " '13	251,278	*122,063	129,215	58,654	70,561
12 " " '14	2,491,684	*1,433,513	1,058,171	762,736	295,435
12 " " '13	2,251,109	*1,243,144	1,007,965	686,218	321,747

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Aug., '14	$219,250	*$124,388	$94,862	$59,519	$35,343
1 " " '13	228,532	*139,279	89,253	48,860	40,393
12 " " '14	2,740,793	*1,710,759	1,030,034	641,522	388,512
12 " " '13	2,626,252	*1,486,783	1,139,469	586,595	552,874

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE

1m., Aug., '14	$76,293	*$41,221	$35,072	$15,503	$19,569
1 " " '13	81,046	*40,396	40,650	15,529	25,121
12 " " '14	670,432	*460,149	210,283	184,754	25,529
12 " " '13	666,708	*410,694	256,014	176,318	79,696

PORTLAND (MAINE) RAILROAD

1m., Aug., '14	$121,027	*$79,435	$41,592	$19,880	$21,692
1 " " '13	130,854	*62,282	68,572	16,380	52,192
12 " " '14	1,033,387	*643,829	389,558	253,497	136,061
12 " " '13	1,028,607	*706,711	321,896	138,486	183,410

*Includes taxes.

Traffic and Transportation

TRAINMEN'S MEETING AT LAWRENCE

So-Called War Meeting Held Recently to Discuss the Item of Expense, the Enemy Against Gross Receipts.

It is the practice of the managers of the various properties controlled by the Albert Emanuel Company, Dayton, Ohio, to hold meetings of the trainmen every week. At Lawrence, Kan., a so-called war meeting was held recently. The men were addressed by J. T. Skinner, manager of the Lawrence Railway & Light Company. This meeting was particularly fruitful in results and provoked considerable discussion. An abstract of Mr. Skinner's remarks follows:

"We will call this our 'war meeting,' simply making use of the latest issue as a synonym. Our work is to give efficient service at the lowest possible expense. A war council has for its object consideration of the best methods of attacking the enemy. We are together to consider plans for attacking the items of expense, our enemy against our net receipts. This does not mean that we have not appreciated your efforts in carrying on this war against expenses, but it does mean an attack with renewed energy against unnecessary expense. As we have no desire to cut down the service or throw men out of employment, it is up to us to see if we cannot, by our 'safety first' movement and courteous treatment of the public, increase receipts and decrease operating expenses so that our net receipts shall be greater and the capital invested in the property feel less like going on strike. We hope each will enter into the spirit of the movement and do cheerfully whatever extra work may be involved. You men can easily note the attitude of the people. We are giving the equivalent or better service than four years ago. On three recent Sunday evenings we had fully as many at the park as when the resort was new, but the receipts were from $60 to $100 less than formerly. People walk out, get all they can free and walk back.

"The main thing in connection with our expenses is the question of accidents. 'Safety first' comes ahead of good service and courteous treatment. You have more to contend with than you did four years ago. While four years ago we had about 100 automobiles, two weeks ago the number registered with the county was 469 and there were fully thirty more that had not been registered. Good paving and long blocks tend to encourage the speeding of automobiles and motor cycles. In this 'safety first' campaign we want the co-operation of the automobile owners and drivers. If you men are not careful, it will do very little good to put 'safety first' slogans in the cars and publish articles in the papers. The men in our organization must be the leaders in the 'safety first' campaign against accidents. The cards in the cars, the articles in the newspapers and the blotters given to the school children all tend to help this movement.

"Accidents are always costly. Even if no damage is done, service is delayed and time and expense are involved in making investigations. It is up to you to get as accurate and thorough a report on the spot as possible. In connection with accident cases the tendency has grown on the part of the public to file claims for an amount which they think does not justify the expense on the part of the company of making a thorough investigation and contesting the case. The best way to deal with the matter is to prevent accidents from occurring, or at least cut the number down to a minimum. We cannot pay you men a 1 per cent dividend if our receipts continue to decrease and our expenses to increase. We must earn that dividend by saving it in our operating expenses. Watch the little things.

"The 'safety first' movement depends more on the spirit with which it is entered into than on the actual equipment, devices or methods employed. Another feature of the 'safety first' movement is concentration. Concentration presupposes that you can keep your mind on what you are doing and not worry about other conditions. In running your car have your mind on your work. There are many things that cause a man to worry, but by keeping them out of your mind while you are on duty you make your own work easier, with better results for the company and for yourself.

"In this 'safety first' movement we have placed fourteen safety slogans in the cars. We want more. We want your

assistance in helping to work up safety slogans that will add interest to the campaign and be of benefit to you and to the company. We are going to make small rewards for safety slogans handed in. Mr. Rice will act as judge. We figured on offering prizes of 50 cents each for the ten best 'safety first' slogans and 25 cents each for all other 'safety first' slogans that we accept. We will not know nor will Mr. Rice whether the whole prize will go to one man or be divided among ten."

In the general discussion which followed the men told their experiences. The feeling was that the automobilist of to-day is more careless and causes more trouble than did the operators of cars four years ago. The new traffic ordinance was also considered, and it was agreed that respect for the measure could be secured best by the trainmen themselves paying strict and constant obedience to every provision of the ordinance.

Gasoline-Electric Bus Service for Springfield, Mass.—Regular electric motor bus service will shortly begin at Springfield, Mass., under the auspices of the Springfield Transit Company, between the downtown district and the Forest Park section of the city. The equipment consists of a bus seating twenty-eight passengers and driven by a 15-kw gasoline-electric-generator unit supplying energy to a 25-hp motor. The company contends that with a 10-cent fare the service will be more flexible than can be afforded by the local trolley system.

Service Problems in Cincinnati.—At a meeting of the committee on transportation of the Federated Improvement Association of Cincinnati, Ohio, on Oct. 8, a report of its investigation into the street-railway service was made. While a communication was sent to the City Council asking that steps be taken to furnish the kind of service people want, it was explained that Walter A. Draper, vice-president of the Cincinnati Traction Company, had informed the committee that the transfer and rerouting plans were now in process of adjustment between the Council and representatives of the company.

Authority of Pennsylvania Commission Over Boroughs.—S. H. Mountney, general manager of the Slate Belt Electric Street Railway, Pen Argyl, Pa., recently complained that the action of the borough of Pen Argyl in refusing to permit cars to stand on tracks at terminal points frequently resulted in patrons missing desired connections. The commission in dismissing the complaint wrote in part as follows: "Speaking generally, this commission would have no authority under the act of Assembly to issue any orders against boroughs, since they are not public service companies within the meaning of the Public Service Company Law. Such boroughs are vested with certain authority over the use and occupation of the streets and highways within their territorial limits and for an abuse of such authority, unwarrantably interfering with the performance of the railway's duty as a public service company, the company would have an appropriate remedy in the courts."

Extension of Safety Zone Idea in Louisville.—In addition to the safety zones which the traffic authorities have created at the downtown street intersections in Louisville, marked with the standards in some cases and indicated by the traffic policemen in others, broad white lines are being painted at intervals across the roadways so as to indicate to the pedestrians inside of which limits they can be assured of safety and to indicate to the motormen where the front ends of their cars are to stop. The experiment was tried first at Fourth and Green Streets, where several hundred persons gathered and watched the painting operation, the paint being applied directly on the wood-block paving. These lines cross the streets at right angles and are in line with the building fronts or inner line of the sidewalks. They do not last more than a day or so and have to be frequently renewed, but it is the impression that they will generally expedite pedestrian traffic and avoid congestion on the sidewalks at the intersections. That the regulation in the traffic ordinance providing for the stopping of automobiles outside the safety zone at downtown street corners when a street car has stopped to take on or let off passengers will be enforced is shown in the record of recent cases arising in the police court.

Personal Mention

Mr. W. T. Waters has been appointed advertising and publicity representative of the Georgia Railway & Power Company, Atlanta, Ga. Mr. Waters was born and educated in Atlanta, and for many years was on the staff of the Atlanta *Journal*.

Mr. Carroll H. Shaw has been appointed electrical engineer of the Sheboygan Railway & Electric Company, Sheboygan, Wis., to succeed Mr. W. B. Voth, superintendent of light and power. Mr. Shaw was born in Abington, Mass. In 1906 he entered the Massachusetts Institute of Technology, and was graduated from the electrical engineering course in 1910. Since that time he has been with the engineering department of the National Lamp Works of the General Electric Company at Cleveland, Ohio.

Major H. C. Evans, of the Lorain Steel Company, was a guest of honor at a dinner on Friday night at the Bellevue-Stratford, Philadelphia, to celebrate the thirtieth year of continuous affiliation with the company. The hosts were members of the sales department of the company and consisted of the following: Messrs. A. L. Verner, S. J. Cotworth, H. L. Gleeson, E. P. Thomas, W. B. Gresham, Daniel Cooldige, P. M. Boyd, Carroll Burton, E. B. Entwistle, A. S. Littlefield, S. P. McGough, William W. Kingston, J. A. Stacey and E. M. Noonan.

Mr. James C. Ernst has retired as the active head of the South Covington & Cincinnati Street Railway, Covington, Ky., as well as from the management of the Columbia Gas & Electric Company, the Union Gas & Electric Company and the Union Light, Heat & Power Company. In the future Mr. Ernst will be associated with these companies in an advisory capacity. Mr. Ernst has been connected with the South Covington & Cincinnati Street Railway and the Union Light, Heat & Power Company since 1896. He has been the active head of the Columbia Gas & Electric Company since its organization in 1907 and he has been associated with the Union Gas & Electric Company since 1911.

Mr. James Harmon, New Albany, Ind., for the last four years claim agent and safety agent for the United Gas & Electric Company and later of all the Insull properties in the New Albany-Jeffersonville-Louisville section, has been made general claim and safety agent for all of Indiana for the Insull properties. Mr. Harmon has risen from the ranks where as conductor he acquired a wide and practical familiarity with actual operating conditions. As claim and safety agent he had great influence in reducing the casualties on the Southern Indiana Insull lines. He was one of the first to use street-car cards to advertise correct methods of boarding and leaving cars and perfected for his company the periodical examinations of trainmen and other employees to keep them alert as to safety precautions. In his new post Mr. Harmon will have his headquarters in Indianapolis. He will be succeeded in New Albany by Henry Hutchins.

Mr. George B. Wheeler, secretary and general manager of the Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., and a past president of the Wisconsin Electrical Association, has resigned to devote his time to private interests. Mr. Wheeler's resignation followed twenty-three years of active management of the railway and light property at Eau Claire. Mr. Wheeler and his partners sold their interests in the Chippewa Valley Railway, Light & Power Company and the Chippewa River Water Power Company to the Kelsey-Brewer Syndicate, Grand Rapids, Mich., at which time all the old officers and directors retired. After engaging in journalistic work for a number of years, Mr. Wheeler entered the electric railway field in 1891 as general manager of the Eau Claire Street Railway, Light & Power Company. Subsequently he was appointed receiver of the property. When the company was reorganized Mr. Wheeler was elected secretary and general manager and the name was changed to Chippewa Valley Railway, Light & Power Company. Later the Chippewa River Water Power Company was organized for development work, and at the time of Mr. Wheeler's retirement this company owned all the water powers on the Menominee River and a valuable water power on the Chippewa River.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Niagara River & Eastern Railroad, Niagara Falls, N. Y.**—Application for a charter has been made in New York by this company to build an interurban railway from the terminal of the Buffalo, Lockport & Rochester Railway in Buffalo along the right-of-way of the Niagara, Lockport & Ontario Power Company to Niagara Falls. Capital stock $1,500,000. Headquarters: Niagara Falls. Incorporators: E. G. Connette, president of the International Railway; Frank A. Dudley, vice-president of the Buffalo, Lockport & Rochester Railway; A. J. Porter and A. W. Gray, Niagara Falls.

Oil Belt Terminal Railway, Jennings, Okla.—Chartered in Oklahoma to build an electric railway from Coffeyville, Kan., through the oil fields of Oklahoma. Capital stock, $100,000. Incorporators: Joseph Hall, Cincinnati; W. A. Ledbetter, Oklahoma City, and W. N. Patterson, Muskogee. [E. R. J., June 13, '14.]

***West Virginia Electrical Company, Parkersburg, W. Va.**—Chartered in West Virginia to build an electric railway from Weston to Owensport, 50 miles. Connection will be made at Owensport with the lines of the Little Kanawha Railway.

FRANCHISES

Fresno, Cal.—The Fresno Traction Company has received a franchise from the Council on South J Street and Fresno Avenue in Fresno.

Long Beach, Cal.—The Pacific Electric Railway has asked the Council for a thirty-five-year franchise over certain streets in Long Beach.

Parker, Cal.—The Parker & Colorado River Electric Railway has received a franchise from the Department of the Interior to build an electric line through the Colorado River Indian Reservation. The proposed line will extend from Parker to a point near Ehrenberg, where a ferry will be constructed to receive freight for the Palo Verde Valley. Grading for this railway will be begun at once. W. H. Tharpe, is interested.

Sacramento, Cal.—The Pacific Gas & Electric Company has received from the Council an extension of time on its franchise in which to complete the extension of the Riverside line in Sacramento.

Marion, Ill.—The Southern Illinois Railway & Power Company has received a franchise from the Board of Supervisors of Williamson County to build an electric line from Marion to Carrier Mills.

Lafayette, Ind.—The Lafayette & Northwestern Railway has received a franchise from the County Commissioners of Benton County to build an electric line from Lafayette to Kankakee where connection will be made with a line to Chicago. A branch line will be built to include Fowler, the county seat of Benton County. The terms of the franchise state that the line must be in operation from Lafayette to Rensselaer by Jan. 1, 1916. [E. R. J., Sept. 19, '14.]

***Alexandria, La.**—Messrs. S. A. Guy and W. A. Sullivan, Shreveport, have asked the Council for a franchise to build an electric line in Alexandria.

New Bedford, Mass.—The Union Street Railway has asked the Council for a franchise to extend and double-track several of its lines in New Bedford.

Westfield, Mass.—The Springfield Street Railway has received a franchise from the Council to build a double track on the south side of State highway, so that it will be possible to use the new underpass beneath the Boston & Albany Railroad tracks leading to the Westfield State Sanitarium and the East Mountain section in Westfield.

Worcester, Mass.—The Worcester Consolidated Street Railway has asked the Council for a franchise to relocate its tracks on West Street in Worcester.

Sharon, Ohio.—The Farrell Railway has asked the Council for a franchise to build an electric railway in Sharon.

Cornwall, Ont.—The ratepayers of Cornwall were to vote Oct. 14 on a by-law granting the Cornwall Street Railway, Light & Power Company a twenty-year extension of its franchise in Cornwall. Provision is also made for the rebuilding of the loop lines on Cumberland Street and Water Street in Cornwall.

Sarnia, Ont.—The Sarnia Street Railway has been authorized by the City Council to take up its tracks leading to the Pere Marquette Railroad station, and to relay them on Christina Street to Clifford Street and westerly on Clifford Street in Sarnia.

Richmond, Va.—The Virginia Railway & Power Company will ask the Council for a thirty-year franchise in Richmond.

Martinsburg, W. Va.—The Youngstown-Sharon Railway & Light Company has asked the Council for an extension of time on its franchise in Martinsburg.

TRACK AND ROADWAY

Hot Springs (Ark.) Street Railway.—Plans are being made by this company to begin work soon on the extension of the Malvern Avenue line in Hot Springs to the Hot Springs Country Club.

Pine Bluff (Ark.) Company.—Material has been ordered and work will soon be begun by this company on the extension of the East Sixth Avenue line in Pine Bluff.

Pacific Electric Railway, Los Angeles, Cal.—This company has taken initial steps toward connecting the Riverside line with the Los Angeles main line. The work of laying the track from the main line to the Riverside line will be begun at once.

California Terminal Railway, Sacramento, Cal.—This company, which plans to build an electric line from San Rafael to Sacramento, is obtaining right-of-way through Jamison Canyon in Solano County. C. W. Conlisk, San Francisco, is interested. [E. R. J., Oct. 12, '14.]

Sacramento (Cal.) Interurban Railway.—The project to build a 30-mile electric railway between Sacramento and Roseville, via Fair Oaks, Orangevale and small towns in Placer County, has been abandoned and the directors of the company have filed notice of dissolution with the Secretary of State. [E. R. J., April 6, '12.]

Pacific Gas & Electric Company, San Francisco, Cal.—The Chamber of Commerce is negotiating with this company for the possible raising of a bonus to extend the company's line to the Libby, McNeil & Libby plant in Sacramento.

San Francisco (Cal.) Municipal Railway.—Plans are under way for an extension on Columbus Avenue in San Francisco for a connection with the Union Street line to North Point Street, thence to Van Ness Avenue and thence to Chestnut Street to connect with the Van Ness Avenue line. Plans are also under way for an extension through the Fort Mason Military Reservation to Laguna Street at an entrance to the Panama-Pacific Exposition grounds; for the construction of the California Street line from Thirty-third Avenue to Second Avenue, thence along Geary Street to the Geary Street line; also for a line on Church Street.

Sausalito (Cal.) Incline Railway.—The Railroad Commission has granted this company a certificate of public convenience and necessity to operate an incline railway in Sausalito, Marin County. The company is also authorized to issue $15,000 of preferred stock or common stock for the acquisition of right-of-way and other property. Allen H. Vance, Sausalito, is interested. [E. R. J., June 6, '14.]

Waterbury & Milldale Tramway, Waterbury, Conn.—The Public Utilities Commission has granted this company authority to construct 2.88 miles of new track in Southington.

Washington Railway & Electric Company, Washington, D. C.—This company is asked to consider plans to extend its line from Fourteenth Street and B Street southwest to the entrance of the new bureau of printing and engraving in Washington.

Jacksonville (Fla.) Traction Company.—Plans are being considered by this company to extend some of its lines in Jacksonville. An extension on Hogan Street from Bay Street to Eagle Street, Cedar Street and Pearl Street will soon be built.

Peoria (Ill.) Railway.—This company has placed in operation its new double track line on Main Street as far as Western Avenue in Peoria.

Terre Haute, Indianapolis & Eastern Company, Indianapolis, Ind.—Work will be begun at once by this company on the extension of the South Eighth Street line from H Street to M Street in Richmond.

***Keokuk, Ia.**—Plans are being made to build an electric railway from Keokuk, Ia., west to Wayland, Mo., thence south via Williamstown, La Belle, Newark, Bethel, Shelbyville, Shelbina, Paris, Mexico and Fulton to Jefferson City, about 140 miles. H. W. Knight, Chicago, represents a number of capitalists who are back of the project.

Orleans-Kenner Electric Railway, New Orleans, La.—Surveys have been completed by this company between New Orleans and Baton Rouge, 100 miles; grading has been completed from New Orleans to Kenner, 9 miles; grading is in progress from Kenner to St. Charles Parish, 2½ miles; 9.6 miles of track has been laid from both ends of this line and all contracts have been awarded to build this line to connect New Orleans, Hanson City, Harrihan, Harlem, Shrewsburg, Arnaults, Providence and Hanson City. The principal contractor is the Johnson & Company, Inc., 409 Tulare Newcomb Building, New Orleans. Officers: E. A. Stanford, New Orleans, president, and John Lorenz, secretary and treasurer. [E. R. J., July 18, '14.]

Bay State Street Railway, Boston, Mass.—Plans are being made by this company to relay the track on the south side of River Street in Haverhill this fall.

Holyoke (Mass.) Street Railway.—Work has been begun by this company installing a double track throughout Aldenville.

Transcona, Man.—By arrangement with the Transcona, Man., Council, J. H. Kern, who holds the franchise to build an electric railway in Transcona, to the boundary of the City of Winnipeg, is required to begin active construction on the line in the spring of 1915. It is said that certain preliminary work is being done, however, and that ties have been delivered along the route.

United Railways, St. Louis, Mo.—Plans are being considered by this company to have its Union Avenue line extended to the city limits of St. Louis.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—This company is asked to consider plans to extend its lines from Crosswick to Allentown and Hightstown.

Piedmont & Northern Railway, Charlotte, N. C.—An extension between Spartanburg and Gastonia, 32 miles is being planned by this company. An extension northward from Charlotte to Concord, N. C., about 25 miles is being considered and another extension from Concord to Salisbury, Greensboro and Durham is also being contemplated. The work on the Concord branch will be begun first.

Columbus Railway, Power & Light Company, Columbus, Ohio.—An extension of the Arlington line in Columbus into the new addition as far as the intersection of Arlington Avenue and Cambridge Boulevard is being planned by this company.

Ardmore & Western Interurban Railway, Ardmore, Okla.—As soon as financial backing can be obtained work will be begun by this company on its line between Ardmore and Oil City. [E. R. J., May 30, '14.]

Cushing (Okla.) Traction Company.—Preliminary arrangements are being made by this company to build its 13-mile line from Cushing to the oil fields. R. D. Long, McAlester, is interested. [E. R. J., Jan. 6, '14.]

Oil Belt Traction Company, Oklahoma City, Okla.—Since the announcement that this company plans to build an electric line from Coffeyville, Kan., through the northern oil fields numerous towns and cities are trying to be included in the system. The present plans are to extend the line south via Bartlesville, Miami, Afton, Tulsa and Chandler to Oklahoma City, together with intermediate points. Centralia, an inland town near Afton, has offered the company 10 miles of right-of-way, 5 acres of land for depot purposes and $5,000 as a bonus. [E. R. J., June 13, '14.]

London & Port Stanley Railway, London, Ont.—The electrification of this railway, the city's road to Lake Erie, will not be delayed on account of the war, and rehabilitation work is being rushed ahead.

London & Port Stanley Railway, London, Ont.—The rehabilitation electrification of this railway, the city's road to Lake Erie, will not be delayed on account of the war.

***Mexia, Tex.**—Plans are being considered by the Mexia Commercial Club to obtain a franchise to build an electric railway in Mexia.

Kelso & Eastern Railroad, Kelso, Wash.—No definite plans have yet been decided upon by this company in connection with the construction of the proposed line between Kelso and Mayfield. J. L. Harris, Kelso, president. [E. R. J., Oct. 4, '14.]

Mercer Electric Railway, Athens, W. Va.—Grading has been completed and as soon as financial backing can be obtained work will be begun by this company on the construction of its 7-mile line between Athens and Princeton. R. G. Meador, Athens, president. [E. R. J., July 29, '14.]

Weston & Glenville Electric Railroad, Weston, W. Va.—The proposed plan to build a 25-mile electric railway between Weston and Glenville is still in the preliminary stage. Lloyd Rinehart, Weston, is interested. [E. R. J., Dec. 27, '14.]

Janesville & Madison Traction Company, Madison, Wis.—Surveys have been completed by this company for its 43-mile line between Janesville and Madison, via Edgerton, Albion, Stoughton, Skirting Lakes and Lake Morona. C. A. Van Ness, Madison, secretary. [E. R. J., July 25, '14.]

SHOPS AND BUILDINGS

Northern Electric Railway, Chico, Cal.—Work will be begun at once by this company on the new depot at the corner of Myers Street and Robinson Street in Oroville.

Iowa Railway & Light Company, Cedar Rapids, Ia.—Plans are being made by this company to enlarge its passenger station at Cedar Rapids.

Mesaba Electric Railway, Virginia, Minn.—This company has completed its new carhouses between Virginia and Mountain Iron. They are equipped with machinery for repairing cars and motors.

Southern Traction Company, Dallas, Tex.—New passenger stations will be erected at once by this company in Abbott, Corsicana, Forreston and Milford. The structures will all be one story and of brick construction. Each depot is estimated to cost $3,000.

POWER HOUSES AND SUBSTATIONS

Shore Line Electric Railway, Saybrooke, Conn.—This company is installing the following new equipment at its power house at Thamesville: one 1875-kva Westinghouse-Parsons turbo-alternator, 25 cycles, 2300 volts, 3625-kva step-up transformers 2300 to 2200 volts; a 25-kw, 125-volt, motor-driven exciter, a new high-tension switchboard, a 500-hp Edgemoor boiler equipped with a Westinghouse underfeed forced draft stoker and a 6 x 12 x 10 outside packed Worthington boiler feed pump.

Columbus Railway, Power & Light Company, Columbus, Ohio.—It has been announced that this company will at once install in its Gay Street power house a new 1000-kw motor generator set, an order for which was placed some time ago.

Bryan & Central Texas Interurban Railway, Bryan, Tex.—Work has been begun by this company on the concrete foundations for its new power plant in Bryan. The generators, engine and all necessary equipment has been ordered.

Glen Rose & Walnut Springs Railway, Walnut Springs, Tex.—Plans are being contemplated by this company to build a new power plant between Glen Rose and Walnut Springs.

Monongahela Valley Traction Company, Fairmont, W. Va.—Plans are being made by this company to build a new power plant in Hutchinson.

Manufactures and Supplies

ROLLING STOCK

Kansas City (Mo.) Railway is reported to have sent out specifications for forty new cars.

Ogdensburg (N. Y.) Street Railway has ordered one car-body from the Wason Manufacturing Company.

Dallas (Tex.) Consolidated Street Railway has received twenty cars built by the American Car Company.

Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., has ordered one line car from the McGuire-Cummings Manufacturing Company.

Geary Street Municipal Railway, San Francisco, Cal., has ordered fifty more cars from the Jewett Car Company, now making a total of 175 cars ordered.

Danville (Va.) Traction & Power Company, Danville, Va., has ordered two cars from the Southern Car Company. The Westinghouse Electric & Manufacturing Company will furnish the electrical equipment, consisting of quadruple 40-hp motors and control.

Boston (Mass.) Elevated Railway has ordered six center-section car bodies for articulated car bodies from the Laconia Car Company, in addition to the previous order for thirty-seven center-sections noted in the ELECTRIC RAILWAY JOURNAL of Sept. 12, 1914. The company is also planning to send out next week specifications for a large number of trail cars, for use in its new Boylston Street subway.

Cleveland (Ohio) Railway, noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, 1914, as having ordered 100 prepayment center-entrance motor cars from the G. C. Kuhlman Car Company, has specified the following details for this equipment:

Seating capacity.....62	Door signal device, Elec. Serv. Sup. Co.
Weight, exclusive of trucks and motors.....21,052 lb.	Fare boxes.....Cleveland
Bolster centers, length..26 ft.	Fenders .....Eclipse
Length over vestibule..50 ft.	Gears and pinions.....West.
Width over sills....8 ft. 2 in.	Gongs .....Brill
Width over all...8 ft. 4½ in.	Hand brakes...ry. co.'s vert.
Height, rail to sills..25½ in.	Heaters.....Peter Smith
Height, sill to trolley base, 9 ft. 6 1/16 in.	Headlights .....Dayton
Body .....semi-steel	Journal boxes....Symington
Interior trim.....cherry	Motors, 4 West. 340, outside hung
Headlining .....Agasote	Paint .....Sherwin-Williams
Roof.....plain arched	Sanders .....Nichols-Lintern
Underframe .....metal	Sash fixtures.....Kuhlman
Air brakes.....West.	Seats, Brill trans. and long. rattan
Axles .....Pollock	Trolley base.....ry. std.
Bumpers..ry. std. 6 in. chan.	Trucks.....Brill 51-E-1
Cables.....ry. std.	Varnish, Outside, Chicago Varnish Co.; inside, Wright Bros.
Car trimmings..ry. & Kuhlm.	Ventilators..Scullin's design
Control .....West.	Wheels, Pittsburgh Forged Steel Co.
Couplers .....O-B.	
Curt'n fixtures.Cur. Sup. Co.	
Curtain material..Pantasote	
Destination signs, Hunter Illuminated	

TRADE NOTES

W. T. Kyle has joined the sales force of the Okonite Company at its general office, 253 Broadway, New York. Mr. Kyle for the past six years has been connected with the Duplex Metals Company as district sales manager.

Union Switch & Signal Company, Swissvale, Pa., has received an order from the Chicago, South Bend & Northern Indiana Railway to install a.c. automatic block signals between its car barns and Weller Avenue, La Port, Elkhart and Miller, Lake Erie crossing, La Port and Winklers, South Bend, and on the Southern Michigan, South Bend and State Line. There will be sixty-four one-arm, Style "B," upper quadrant, left-hand semaphore signals operating in two positions between 0 deg. and 45 deg. They will be installed on the TDB system, which permits two trains to be between turnouts going in the same direction, but prevents opposing movements. The signals will be controlled by continuous a.c. track circuits and the materials and construction will be similar to the installation already in service which was recently installed by this signal manufacturer.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has received an order from the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., for 600/1200 volt railway apparatus for operation over its new 60-mile extension between Waterloo and Cedar Rapids, consisting of the following equipment: Five 60-ton locomotive equipments, seven high-speed equipments for two-car train operation in limited parlor-buffet and observation service, five equipments for local passenger and baggage service, four trailer equipments for local train service, one express car equipment, and one line car equipment. This company has also received the following orders for equipment: Cleveland (Ohio) Railway, 408 type No. 340 motors and control for quadruple equipments for low-floor center-entrance cars; Washington-Virginia Railway, five quadruple motor and pneumatically operated control equipments; Kansas City, Clay County & St. Joseph Railway, one combination freight and work car equipment, consisting of quadruple No. 327-C motors and double end electro-pneumatically operated unit switch control, for 600/1200 trolley operation; Ogdensburg (N. Y.) Street Railway, one double equipment of No. 323-A motors and control; Seattle (Wash.) Municipal Street Railway, one quadruple equipment of No. 310-C motors and double end unit switch control of the electro-pneumatic type, with an additional feature of an emergency brake operated by means of dynamic braking.

ADVERTISING LITERATURE

Tool Steel Gear & Pinion Company, Cincinnati, Ohio, has issued a folder which contains comparative data on the wearing qualities of case-hardened and tool steel gears and pinions.

Union Switch & Signal Company, Swissville, Pa., has issued Bulletin No. 79 which describes its electric crossing gate, and Bulletin No. 80 describing its model No. 13 low voltage, d.c. switch movement.

Goldschmidt Thermit Company, New York, N. Y., prints in its quarterly publication, *Reactions*, an illustrated article on welding rails with thermit and grinding joints on the San Antonio (Tex.) Street Railway.

American Rolling Mill Company, Middletown, Ohio, has issued a catalog which contains a large number of testimonial letters in regard to its products, among which are included condensers, boiler tubes, culverts and sheet-metal work for buildings.

Root Spring Scraper Company, Kalamazoo, Mich., has issued a thirty-two-page illustrated pamphlet entitled "The Passing of the Sweeper." In this the Root spring scraper is described and mention is made of its efficiency in handling snow. This company's railway spring scraper, special Root scraper, manually or air operated, the Kalamazoo scraper and the Root spring life guard are illustrated and described in detail.

W. N. Matthews & Brother, Inc., St. Louis, Mo, have issued a sheet which illustrates in detail their holdfast lamp guards. A clamping collar locks the guard to its socket. The guard does not touch the lamp anywhere and holds the lamp so that it is always at least 1 in. from any combustible material. A special spring cushion absorbs shock and vibration.

Bayonet Trolley Harp Company, Springfield, Ohio, has issued a folder which discusses the defects and remedies for trolley equipment. In this little treatise quotations are liberally taken from the articles of C. W. Squier, assistant engineer New York Municipal Railway Corporation, which have appeared from time to time in the ELECTRIC RAILWAY JOURNAL. The valuable suggestions of Mr. Squier on trolley maintenance, expressing as they do the results of practical experience and careful observation, are supplemented in the folder by comments showing how the trolley equipment manufactured by this company meets the requirements outlined in his articles.

On the Pier at Atlantic City

MORNING and afternoon the Main Building was aglow with lights and color blended in a wonderfully harmonious fashion, kaleidoscopic in its dazzlingly brilliant effect. Gaily talking, leisurely moving men and women in couples and groups thronged the exhibit sections, the aisles and the vast reception space. At intervals the hum of conversation and the sounds from electric machinery were subdued by the strains of popular music from a large orchestra. Along one side of the reception space, amid an artistic setting of flowers and plants, oriental rugs and hangings, were shown Brill trucks, car seats, springs and other car and truck paraphernalia; in the center, an illuminated photograph stand in the form of a large hexagon column, displayed latest types of city and interurban cars. On the Boardwalk opposite the Pier, a car of the Third Avenue Railway Company's low-level convertible type mounted on a "Radiax" truck, bore the same name in electric lights across the roof.

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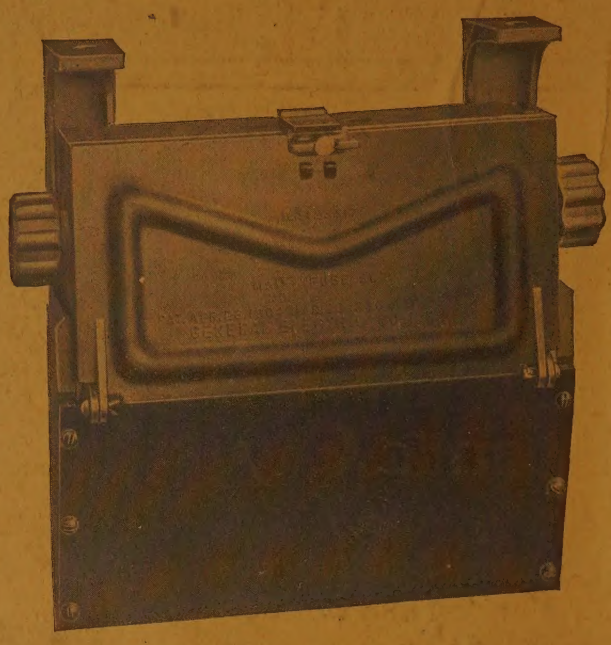

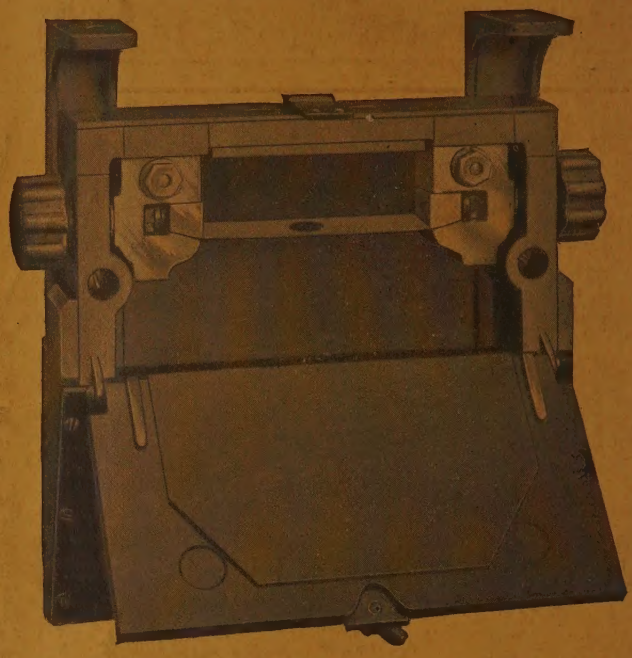

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It is easy to replace a fuse owing to the simple construction and accessibility of the clamping mechanism. A car need not be held up by a blow-out.

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For Texas, Oklahoma and Arizona business refer to Southwest General Electric Company, (formerly Hobson Electric Co.), Dallas, El Paso, Houston and Oklahoma City. For Canadian business refer to Canadian General Electric Company, Ltd., Toronto, Ont.

5214